

# THE *American Journal* OF *Gastroenterology*

VOL. 23, NO. 2

FEBRUARY, 1955

Ileocecal Valve Prolapse Simulating Cecal Polyp  
Gastric Decompression  
Clinical and Roentgenological Effects  
of a New Anticholinergic in Gastrointestinal Disease  
Mucocoele of Appendix Superimposed by  
Acute Suppurative Inflammation  
The Double Gallbladder  
New Method for the Determination  
of the Size of the Liver and Spleen  
Clinical Trial of Erythromycin in Amebic Liver Abscess

*Second Annual Convention*

*Chicago, Ill.*

*24, 25, 26 October 1955*



Official Publication

AMERICAN COLLEGE  
OF GASTROENTEROLOGY

agents  
of *for the treatment of pneumonia*  
and other respiratory tract infections  
choice  
Terramycin<sup>®</sup>  
BRAND OF OXYTETRACYCLINE

For (ESTABLISHED) broad-spectrum antibiotic therapy—supplied in convenient Capsules, Tablets (sugar coated), Oral Suspension (raspberry flavored), Pediatric Drops (raspberry flavored), Intramuscular, Intravenous, Ophthalmics, Ointment and other topical forms.

Tetracyn<sup>®</sup>  
BRAND OF TETRACYCLINE

For the (NEWEST) broad-spectrum antibiotic therapy—supplied in convenient Capsules, Tablets (sugar coated), Oral Suspension (chocolate flavored), Pediatric Drops (banana flavored), Intramuscular, Intravenous, Ophthalmic and Ointment.

Both discovered by  world's largest producer of antibiotics

PFIZER LABORATORIES, Brooklyn 6, N. Y.  
Division, Chas. Pfizer & Co., Inc.

## Searle MICTINE Provides Effective Oral, Non-Mercurial Diuresis

The result of many years of research, Mictine, brand of aminometramide, supplies a long-felt need for an improved oral diuretic. Mictine, 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione, is not a mercurial, xanthine or sulfonamide.

**Effectiveness:** Every method for measuring the diuretic effect in man now available,

is no risk of acidosis. On high dosage, Mictine causes some side effects in some patients but on three tablets daily these side effects (anorexia and nausea, rarely vomiting, diarrhea or headache) are minimal or absent.

**Indications:** Mictine is useful primarily in the *maintenance* of an edema-free state and in the *initial and continuing* control of patients in mild congestive failure. Mictine may be used also for *initial and continuing* diuresis in *more severe* congestive states, particularly when mercurial diuretics are contraindicated.

**Administration:** The usual dosage for the average patient is one to four tablets daily with meals, in divided



*Mictine is believed to act by the selective inhibition of the reabsorption of sodium ions. Thus, the resulting diuresis is characterized by increased quantities of sodium ions and water.*



including precise human bioassay studies, without exception demonstrated that Mictine is an effective oral diuretic, and these studies show that approximately 70 per cent of *unselected* edematous patients treated with Mictine by mouth respond with a satisfactory diuresis.

**Well-Tolerated:** There are no known contraindications to Mictine, even in the presence of hepatic or renal damage, and there

doses on an interrupted schedule. An interrupted dosage schedule may be accomplished by giving the drug on alternate days or for three consecutive days and then omitting it for four days.

For severe congestive states the dosage is four to six tablets daily with meals, in divided doses on interrupted schedules similar to those already mentioned.

**Supplied:** Uncoated tablets of 200 mg.

\*Trademark of G. D. Searle & Co.

**SEARLE**

# Speaking of antacids —

WHICH DO YOU PRESCRIBE?

Regardless of which antacid you've been using, we believe you'll agree that most of them are rather good.

Still, we'd like to remind you of Syntroge<sup>®</sup>l 'Roche'...because it acts fast (in a matter of seconds) and long (often for hours). For patients with heartburn or too much stomach acid, Syntroge<sup>®</sup>l is really worth trying.



# THE American Journal OF Gastroenterology

(FORMERLY THE REVIEW OF GASTROENTEROLOGY)

*The Pioneer Journal of Gastroenterology, Proctology  
and Allied Subjects in the United States and Canada*

**contents:**

Editorial Board and General Information .....	96
Ileocecal Valve Prolapse Simulating Cecal Polyp LOUIS L. PERKEL, M.D., F.A.C.P., F.A.C.G. and LEONARD TROAST, M.D., F.A.C.G. ....	103
Gastric Decomensation ..... WILLIAM T. GIBB, M.D. ....	109
Clinical and Roentgenological Effects of a New Anticholinergic in Gastrointestinal Disease ..... A. X. ROSSIEN, M.D., F.A.C.G. ....	113
Mucocoele of Appendix Superimposed By Acute Suppurative Inflammation SAUL ALFRED RITTER, M.D., F.A.C.S. and ALFRED HAAS, M.D., F.I.C.S., F.A.C.G. ....	124
The Double Gallbladder: A Congenital Anomaly A. GALAMBOS, M.D. and W. M. GALAMBOS, M.D. ....	129
New Method for the Determination of the Size of the Liver and Spleen WILLIAM NIMEN, M.D., F.A.C.P. ....	147
Clinical Trial of Erythromycin in Amebic liver Abscess VIKIT VIRANUVATTI, M.D. and PRACHA BISESHURARIT, M.D. ....	157
President's Message .....	161
News Notes .....	162
Abstracts for Gastroenterologists .....	164
Book Reviews for Gastroenterologists .....	171

Owned and published monthly by the American College of Gastroenterology, Inc. Business Office: 33 West 60th St., New York 23, N. Y. Editorial Office: 146 Central Park West, New York 23, N. Y. Copyright, 1955, by the American College of Gastroenterology, Inc. Subscription rate, U. S. and possessions: One year \$8.00, two years \$14.00 (foreign \$10.00, \$18.00). Single copy: \$.75. Reentered as second class matter at the Post Office at New York, N. Y., under the act of March 3, 1879.

**Index to Advertisers**

Ames Co., Inc. ....	102
Borden Co. ....	179
Ciba Pharmaceutical Products, Inc. ....	100
Endo Products, Inc. ....	174
Fleet, C. B. Co., Inc. ....	98
Hoffmann-La Roche, Inc. ....	94
Horlicks Corp. ....	170
Lakeside Laboratories, Inc. ....	178
Massengill, The S. E. Co. .... 3rd cover	
National Drug Co. ....	180
Pfizer Laboratories .... 2nd cover	
Rorer, William H., Inc. .... 99, 177	
Schering Corp. ....	101
Searle, G. D. & Co. ....	93
Standard Pharmaceutical Co., Inc. ....	163
Upjohn Co. ....	173
U. S. Treasury ....	176
Warner-Chilcott Laboratories .... 4th cover	
Winthrop-Stearns, Inc. ....	97
Wyeth, Inc. ....	175

OFFICIAL PUBLICATION  
of the  
AMERICAN COLLEGE OF GASTROENTEROLOGY  
33 West 60th Street, New York 23, N. Y.

Editorial Office, 146 Central Park West, New York 23, N. Y.

SAMUEL WEISS, *Editor-in-Chief*

EDITORIAL BOARD

JAMES A. FERGUSON

MILTON J. MATZNER  
J. R. VAN DYNE

MICHAEL W. SHUTKIN

EDITORIAL COUNCIL

ANTHONY BASSLER  
F. W. BANCROFT  
RICHARD BAUER  
BENJAMIN M. BERNSTEIN  
THEODOR BLUM  
DONOVAN C. BROWNE  
JOSE OVEIDO BUSTOS  
LOUIS H. CLERF  
FRANK A. CUMMINGS  
FELIX CUNHA  
HARRY M. EBERHARD  
RUDOLF R. EHRLMANN  
LYNN A. FERGUSON  
CHEVALIER L. JACKSON

WILLIAM C. JACOBSON  
I. R. JANKELSON  
SIGURD W. JOHNSEN  
ELIHU KATZ  
ARTHUR A. KIRCHNER  
WILLIAM W. LERMANN  
FRANZ J. LUST  
CHARLES W. MCCLURE  
LESTER M. MORRISON  
GEORGE C. ORNSTEIN  
GEORGE T. PACK  
GEORGE E. PFAHLER  
MARTIN E. REHFUSS

A. X. ROSSIE  
DAVID J. SANDWEISS  
JOSEPH SCHROFF  
MARKS S. SHAIEN  
I. SNAPPER  
J. EARL THOMAS  
MAX THOREK  
C. J. TIDMARSH  
GABRIEL TUCKER  
ROY UPHAM  
F. H. VOSS  
MICHAEL WEINGARTEN  
LESTER R. WHITAKER  
FRANK C. YEOMANS

Publication Office, 33 West 60th Street, New York 23, N. Y.

DANIEL WEISS, *Managing Editor*

STEVEN K. HERLITZ, *Advertising Manager*

**Contributions:** Articles are accepted for publication on condition that they are contributed solely to THE AMERICAN JOURNAL OF GASTROENTEROLOGY. Manuscripts should be typewritten double-spaced and submitted in two copies. Footnotes and bibliographies should conform to the style recommended by the American Medical Association. Illustrations and diagrams should carry suitable lettering and explanations, be mounted on separate pages and have the name of the author on each page. Four illustrations per article are allowed without cost to the author.

**Reviews:** THE AMERICAN JOURNAL OF GASTROENTEROLOGY will review monographs and books dealing with gastroenterology or allied subjects. It may be impossible to review all material sent. However, an acknowledgment will be made in the Department of Reviews.

The editors and publishers are not responsible for individual opinions expressed by their contributors, nor for those given under current literature.

**Reprints:** A price list and order blank for reprints will be sent to each contributor before the journal is issued.

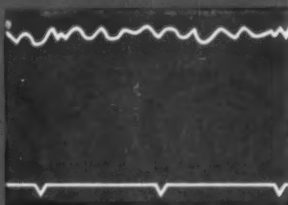
**Subscription price:** U.S. and possessions: one year, \$8.00, two years, \$14.00. Elsewhere, \$10.00, \$18.00. Single copy \$.75. Members of the American College of Gastroenterology receive the JOURNAL as part of their membership.

**Change of Address:** Notify publishers promptly of change of address. Notices should give both old and new addresses.

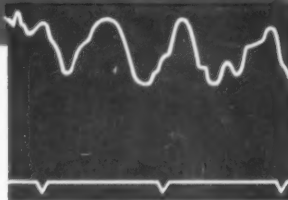
**Superior Effectiveness**  
**Increased Convenience**

**Mucilose®**  
 BLAND BULK HYDROGEL

*For Physiologic Bowel Regulation*



1. Contractions without Mucilose



2. Contractions 24 hours  
 after ingestion of Mucilose

Mucilose — highly purified hemicellulose from psyllium seed — produces gentle, stimulating, bland bulk, physiologically initiating normal peristaltic waves in the large intestine and at the same time soothing the irritable colon.

#### *Superior Effectiveness*

Mucilose absorbs as much as 50 times its weight of water which it effectively retains during passage through the bowel, producing a pliable, demulcent stool.

#### *Increased Convenience*

To the greater effectiveness of Mucilose is added the increased convenience and flexibility of a variety of dosage forms to meet varied needs:

- **MUCILOSE COMPOUND TABLETS**, Mucilose with methylcellulose; bottles of 100 and 1000.

**Greater Bulk • Smaller Dosage • Convenient • Easy to Swallow**

- **MUCILOSE SPECIAL FORMULA Flakes or Granules**
  - Also
  - **MUCILOSE CONCENTRATED Flakes**
- } in tins of 4 oz. and 1 lb.

Mucilose should be taken with 1 or 2 glasses of water.

*Windsor-Stearns*

NEW YORK 18, N.Y. WINDSOR, ONT.

Mucilose: trademark reg. U.S. Pat. Off.

# PROCTOSCOPY

*"A neglected diagnostic procedure"...now simplified with...*



## THE FLEET ENEMA DISPOSABLE UNIT

*"Probably no other office procedure except blood pressure determination in the adult gives as high a percentage of positive diagnostic information."*

— J. L. St. Med. Soc., 106:356, Sept. '54.

It is now a simple matter to prepare patients for proctoscopic or sigmoidoscopic examination during an office visit. The Fleet Enema Disposable Unit is superior in cleansing effect to a tap water or saline enema of one or two pints and less irritating than a soap suds enema. Thorough left colon catharsis, with minimal discomfort to the patient, is usually a matter of only four or five minutes.

Each 4½ fl. oz. disposable "squeeze bottle" contains, per 100 cc., 16 gm. sodium biphosphate and 6 gm. sodium phosphate... an enema solution of Phospho-Soda (Fleet)... gentle, prompt, thorough.

"Phospho-Soda", "Fleet" and "Fleet Enema" are registered trade-marks of C. B. Fleet Co., Inc.



**C. B. FLEET CO., INC. • LYNCHBURG, VA.**

*For nausea, vomiting  
and gastritis*

*new* **probutylin**

(PROCAINE ISOBUTYRATE, RORER)

Probutylin, on oral administration, is an active surface anesthetic to the lining of the upper gastrointestinal tract. Its rapid, direct action is effective in the management of nausea, vomiting and gastritis—also the control of pylorospasm and spasm of the small bowel.

In one series of 104 patients suffering from nausea and vomiting, singultus or pylorospasm, Probutylin gave complete relief to 80%, and the remainder of the patients obtained partial relief.

Exhaustive clinical investigation during the past four years has shown that Probutylin has a low index of toxicity. Patients under medication for more than two years have experienced no untoward effects. The sole contraindication is in certain cases of hypertension.

*Recommended dosage schedule*

**Gastritis:** 1 or 2 capsules 20 minutes before meals and antacid (Maalox®) 20 minutes after meals.

**Post-alcoholic gastritis:** 2 capsules with antacid (Maalox®).

**Pylorospasm:** 2 teaspoonfuls elixir 5 to 10 minutes before meals.

**Nausea and vomiting of pregnancy:** 1 or 2 capsules before rising, 4 during day if needed.

Administer Probutylin with as little water as possible. Dilution reduces its effectiveness.

**Supplied:** Capsules Probutylin, 300 mg., in bottles of 50.  
Elixir Probutylin, 10% in bottles of 180 cc.

*Literature and samples forwarded on request.*



**WILLIAM H. RORER, INC.**

PHILADELPHIA 6 PA.



**Introducing . . .**

**greater safety**

**in topical anesthesia**

**Pyribenzamine<sup>®</sup>**

**Anesthetic Solution and Jelly**

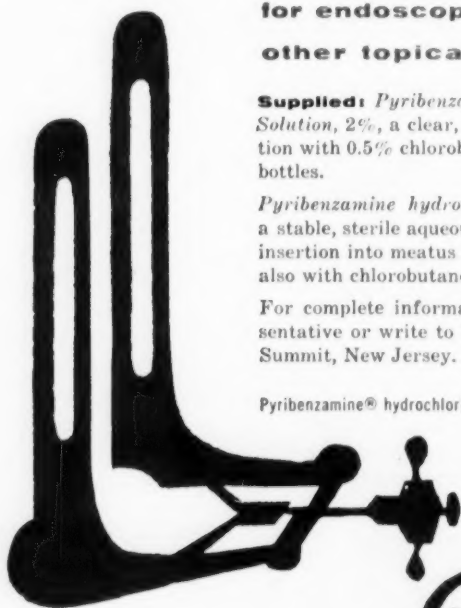
**for endoscopic procedures and  
other topical anesthetic uses**

**Supplied:** *Pyribenzamine hydrochloride Anesthetic Solution, 2%,* a clear, nonviscous, stable, sterile solution with 0.5% chlorobutanol as preservative; in 1-oz. bottles.

*Pyribenzamine hydrochloride Anesthetic Jelly, 2%,* a stable, sterile aqueous jelly with applicator tip (for insertion into meatus for intra-urethral instillation), also with chlorobutanol; in 1-oz. tubes.

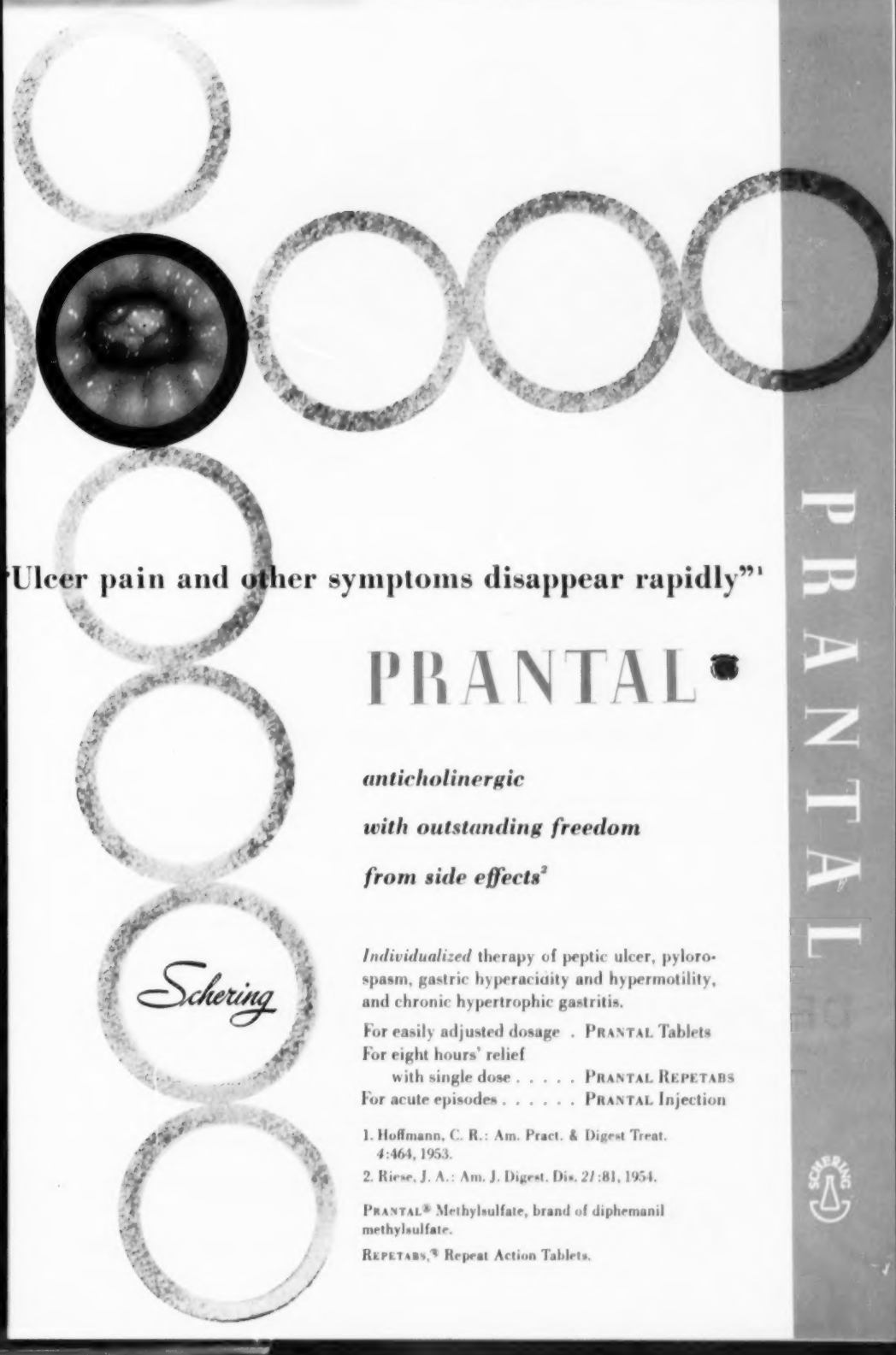
For complete information, consult your CIBA representative or write to Medical Service Division, CIBA, Summit, New Jersey.

Pyribenzamine<sup>®</sup> hydrochloride (tripelennamine hydrochloride CIBA)



**C I B A**

Summit, N. J.



Ulcer pain and other symptoms disappear rapidly<sup>1</sup>

# PRANTAL

*anticholinergic*

*with outstanding freedom*

*from side effects<sup>2</sup>*

*Schering*

Individualized therapy of peptic ulcer, pylorospasm, gastric hyperacidity and hypermotility, and chronic hypertrophic gastritis.

For easily adjusted dosage . . . PRANTAL Tablets  
For eight hours' relief

with single dose . . . . . PRANTAL REPETABS

For acute episodes . . . . . PRANTAL Injection

1. Hoffmann, C. R.: Am. Pract. & Digest Treat.  
4:464, 1953.

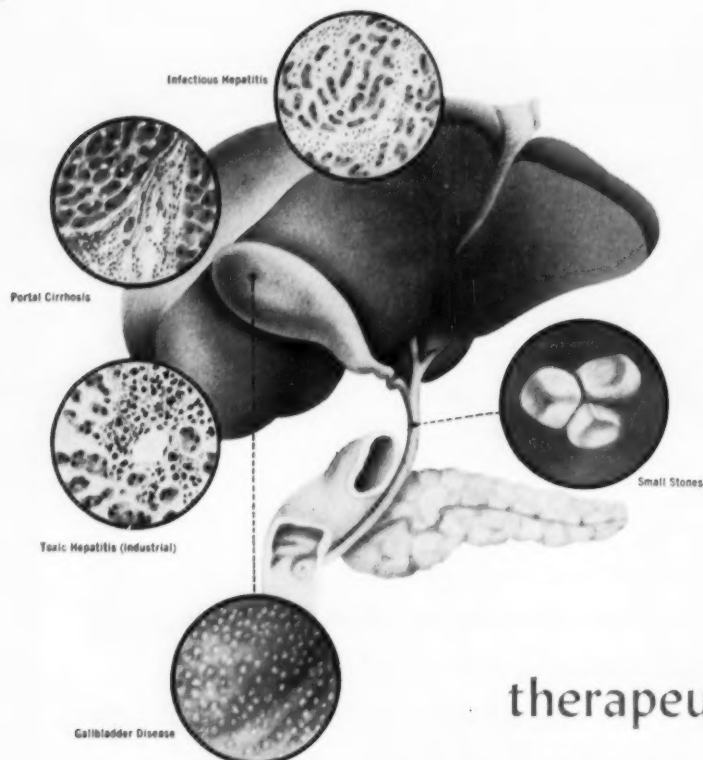
2. Riese, J. A.: Am. J. Digest. Dis. 21:81, 1954.

PRANTAL® Methylsulfate, brand of diphemanil methylsulfate.

REPETABS,® Repeat Action Tablets.

P  
R  
A  
N  
T  
A  
L





therapeutic bile  
in liver and gallbladder disorders

"...due to the production of true hydrocholeresis —  
a marked increase both in volume and fluidity of the bile."<sup>\*</sup>

"...the objectives of the principal therapy cannot but be furthered..."<sup>\*</sup>

"...confirmed further by the clinical experiences reported."<sup>\*</sup>

**DECHOLIN<sup>®</sup> and DECHOLIN SODIUM<sup>®</sup>**  
(dehydrocholic acid, *Ames*) (sodium dehydrocholate, *Ames*)

*Decholin* Tablets, 3¾ gr. (0.25 Gm.); bottles of 100, 500, 1000. *Decholin Sodium*, 20% aqueous solution; ampuls of 3 cc., 5 cc. and 10 cc.; boxes of 3, 20 and 100.

<sup>\*</sup>Schwimmer, D.; Boyd, L. J., and Rubin, S. H.: Bull. New York M. Coll. 16:102, 1953.



**AMES COMPANY, INC • ELKHART, INDIANA**  
Ames Company of Canada, Ltd., Toronto

63190



# THE American Journal OF Gastroenterology

A monthly journal of Gastroenterology, Proctology and Allied Subjects  
(FORMERLY THE REVIEW OF GASTROENTEROLOGY)

VOLUME 23

FEBRUARY, 1955

NUMBER 2

## ILEOCECAL VALVE PROLAPSE SIMULATING CECAL POLYP\*

LOUIS L. PERKEL, M.D., F.A.C.P., F.A.C.G.

and

LEONARD TROAST, M.D., F.A.C.G.

Jersey City, N. J.

Prolapse of the ileocecal valve into the cecum may produce a translucent filling defect in the latter roentgenologically simulating that caused by a polypoid tumor of the cecum. That the existence of this condition is not too well known to the profession is evidenced by the very few published papers on the subject and by the fact that the condition is not even mentioned in some standard text books on gastrointestinal roentgenology. We therefore deemed it advisable to review the sparse literature and add our cases thereto.

Although Strömbeck<sup>1</sup>, in 1941 reported an enlargement of the ileocecal valve in his roentgen description of a case of regional ileitis, it was Golden<sup>2</sup> in 1943, who, in his report of two cases, first called to the attention of radiologists the indentation in the shadow of the barium-filled cecum caused by an enlargement of the ileocecal valve. Both patients were operated upon. In the first, the surgeon found the ileocecal valve to be enlarged due to hypertrophy and edema and there were also present numerous peritoneal adhesions. In the second, the valve was enlarged due to edema of the mucosa of the valve lips and there was found an associated regional ileitis.

Golden<sup>3</sup> also mentions the frequent finding of edema and pouting of the lips of the ileocecal valve in surgical specimens following ileocelectomy for regional ileitis, at the Presbyterian Hospital, New York.

Feldman<sup>4</sup> states that the ileocecal valve shows a slit-like opening surrounded by an upper and lower lip protruding into the lumen of the cecum, usually not observed roentgenologically except on compression films. He adds that when

\*Read before the First Annual Convention of the American College of Gastroenterology, Washington, D. C., 25, 26, 27 October 1954.

the lips are large, which in some instances may be due to edema secondary to an inflammatory process, they may produce a polyp-like defect in the cecum.

Ritvo and Stauffer<sup>5</sup> state that although prolapse of the mucosa of the terminal ileum is a rare condition, its identification is important as it closely simulates the roentgen picture of a polypoid lesion of the cecum, which in many instances requires exploratory laparotomy for definitive differentiation. These authors describe the roentgen findings as a rounded, smoothly-outlined filling defect in the cecum with no obstruction at the ileocecal valve. They stress that a polyp or other benign tumor of the cecum is also smooth in outline and produces a defect which may be indistinguishable from the lesion under discussion. They further add that although carcinoma of the cecum may produce a similar defect, it usually shows irregularity in outline and distortion of the mucosal pattern in the region adjacent to the area of increased radiance.

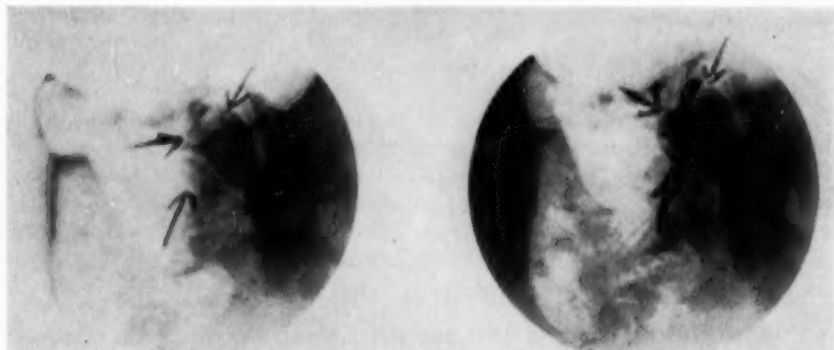


Fig. 1—Case 1. Compression spot films showing oval negative shadow in cecum, representing prolapse of hypertrophied ileocecal valve.

Ellenbogen<sup>6</sup> and his associates, in discussing benign causes of cecal deformity, state that occasionally the ileocecal valve may be thickened enough to produce a smooth, symmetrical, sharply margined cecal filling defect not associated with a palpable mass and showing no evidence of mucosal fold destruction. They also add that pressure films and air contrast studies show folds radiating from a central star.

Hinkel<sup>7</sup>, in 1952, made an excellent and thorough study of the roentgenological examination of the ileocecal valve. In a series of 500 barium enema examinations he was able to recognize the ileocecal valve in over 90 per cent of cases. He found the valve implanted in the cecum posteromesially in 90 per cent of the cases and posteriorly in 8 per cent. Identification of the defect was helped by the application of diffuse pressure over the area and also by rotating the patient in both left and right anterior oblique positions. Although he saw large valves on postevacuation films, he found the latter alone worthless for identifica-

tion or differentiation of the lesion. He also claims that air contrast films exaggerated the defect and thus increased the possibility of its confusion with a polypoid lesion.

Hinkel found no instance of associated regional ileitis. He feels that the ileocecal valve can and should be identified and evaluated in essentially every barium enema examination. He states that conspicuous defects are due to either edema of the valve lips, hypertrophy of the valve, prolapse of the ileal mucosa or any combination of these factors. Hinkel believes that preliminary catharsis may exaggerate the defect caused by ileal prolapse. He concludes that radiologists should not advise surgical exploration in cases of characteristic ileocecal valve defects unless tumor is clinically suspected, especially by the presence of anemia, blood in the stools or a palpable mass.



Fig. 2—Case 2. Large oval homogeneous translucent shadow mistaken for a polypoid lesion but found to be due to prolapsed ileocecal valve.

In a twelve month period (from June 1, 1953 to May 31, 1954) 1,100 routine barium enema examinations were performed at the Jersey City Medical Center. In these 1,100 consecutive cases there were found 19 instances of prolapse of a normal or hypertrophied ileocecal valve as shown roentgenologically by the finding of an oval negative shadow in the cecum at the site of its junction with the terminal ileum. This finding was purely coincidental as the lesion was not sought for or considered in the diagnosis and there was no change from the routine technic of examination. It was, however, demonstrated more often with spot films using moderate pressure.

Besides the oval translucent shadow the condition may be further characterized roentgenologically by a central star-like density with radiations outward, representing barium in the lumen of the ileum and in the crevices of the lips of the prolapsed ileal mucosa.

Of the 19 cases 11 were female and 8 were male. The ages ranged from 21 to 83, the average being 62. Of the 19 cases 3 came to surgery. In no instance in our series was there an associated regional ileitis. In fact we considered any associated pathology to be unrelated to the lesion under discussion which apparently has no pathognomonic symptoms or definitely known etiology.

In the differential diagnosis several conditions, besides polypoid tumor of the cecum, may be considered. Tumor of the valve lips is a rare lesion. Intussusception usually shows a typical cone-shaped defect with transverse markings and widened lumen. An inverted appendiceal stump may produce a defect similar to that of ileal prolapse but its location is away from the ileocecal valve.

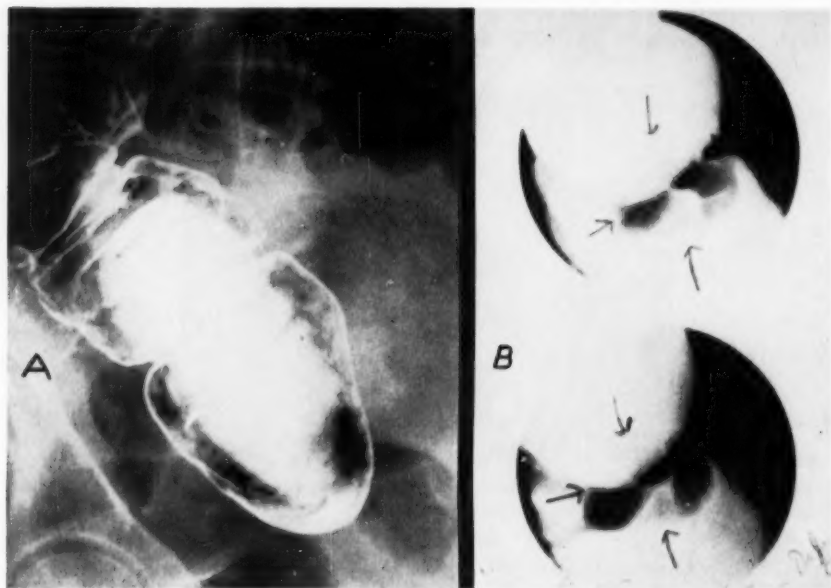


Fig. 3—Case 3. (A) Routine barium enema film without compression showing normal cecum. (B) Spot films with compression showing an oval translucent shadow, with central star, caused by prolapse of the ileocecal valve.

From a review of the literature and our own experience in the cases that were subjected to exploratory laparotomy, the surgical findings have been minimal if any at all. In the light of our present knowledge, there is no indication for repair or resection of the ileocecal valve on the basis of simple hypertrophy, prolapse or a combination of both.

*Case 1:*—F. P., a 52-year old housewife complained of abdominal distention, constipation and weight loss for the past six months. Examination revealed no abnormalities except for a moderate hypochromic anemia. Roentgen studies

of the gastrointestinal tract were negative except for the presence of an oval negative shadow in the cecum (Fig. 1). Because of the clinical suspicion of a cecal neoplasm, exploratory laparotomy was advised. This revealed a prolapsed hypertrophied ileocecal valve, peritoneal adhesions between ileal loops and no polypoid lesion in the cecum. Only lysis of adhesions was done at operation.

*Case 2:*—M. D., a 72-year old nun complained of upper abdominal pain, constipation, weight loss and jaundice. On abdominal examination, a hard fixed mass was palpated in the right upper quadrant. Barium enema examination disclosed a smoothly-outlined, oval negative shadow in the cecum (Fig. 2). A diagnosis was made of probable polypoid carcinoma of the cecum with hepatic metastases. Exploratory laparotomy revealed a primary carcinoma of the liver (cholangioma) with metastases to the hepatic and celiac lymph nodes. No



Fig. 4—Case 4. Barium enema with compression showing oval negative shadow caused by ileocecal valve prolapse.

polyp or polypoid lesion was found in the cecum, the translucent shadow seen on the colon films being presumably caused by hypertrophy and prolapse of the ileocecal valve.

*Case 3:*—M. S., a 56-year old housewife complained of intermittent lower abdominal pain for the past six months. She was known to have cirrhosis of the liver for the past year. Barium enema examination of the colon revealed no abnormalities except on the spot films taken with pressure over the cecum. Here, an oval negative shadow with a central star-like density with radiations was noted (Fig. 3B). The routine films without compression (Fig. 3A) did not show the defect. In view of the absence of any clinical findings suggestive of a polypoid lesion in the cecum and the characteristic appearance of the defect, a diagnosis was made of hypertrophy of the ileocecal valve with prolapse into the cecum. No surgery was performed.

*Case 4:*—M. B., a 70-year old white housewife complained of intermittent attacks of colicky pain in the upper abdomen for the past four years. She had lost no weight nor had any change in bowel habit. Examination revealed no abnormalities. Blood, urine and stool examinations revealed normal findings. Cholecystography showed "nonvisualization of the gallbladder". Roentgen study of the gastrointestinal tract yielded no abnormal findings except for a small oval translucent shadow in the cecum (Fig. 4) believed by us to be due to a prolapsed ileocecal valve. The patient's private physician, however, suspected a polypoid lesion in the cecum. A clinical diagnosis of chronic cholecystitis with cholelithiasis was made. Operation confirmed this diagnosis and revealed no polypoid lesion in the cecum.

#### SUMMARY

The normal or hypertrophied ileocecal valve when prolapsed into the cecum may produce therein a translucent shadow with or without a central slit or star. Although this roentgen picture is usually characteristic, it may strongly simulate and be mistaken for a polypoid lesion of the cecum, frequently requiring exploratory laparotomy for definitive differentiation. When clinical findings suggest tumor, surgery is mandatory.

Nineteen cases of ileocecal valve prolapse were found in 1,100 routine consecutive barium enema examinations. In none was an associated regional ileitis found and any concomitant pathological findings appeared to be coincidental.

The purpose of this brief report has been to bring to the attention of radiologists and gastroenterologists the consideration of ileocecal valve prolapse in the roentgen differential diagnosis of translucent shadows in the cecum.

#### REFERENCES

1. Strömbeck, J. P.: Terminal Ileitis and its roentgen picture, *Acta Radiol.*, **22**:827, 1941.
2. Golden, Ross: Enlargement of the ileocecal valve, *Am. J. Roentgenol.*, **50**:19, 1943.
3. Golden Ross: Radiologic Examination of the Small Intestine, Philadelphia, J. B. Lippincott Co., 1945.
4. Feldman, M.: Clinical Roentgenology of the Digestive Tract, Baltimore, The Williams and Wilkins Co., 1948.
5. Ritvo, Max and Stauffer, I. A.: Gastrointestinal X-ray Diagnosis, Philadelphia, Lea & Febiger, 1952.
6. Ellenbogen, L. S., Johnson, V. E., Molitch, M. and Erber, L.: Some benign causes of cecal deformity, *J. M. Soc. New Jersey*, **50**:290, 1953.
7. Hinkel, C. L.: Roentgenological examination and evaluation of the ileocecal valve, *Am. J. Roentgenol.*, **68**:171, 1952.

## GASTRIC DECOMPENSATION\*

WILLIAM T. GIBB, M.D.

Washington, D. C.

The purpose of this paper is to attempt to give a rational explanation of what goes wrong with the emptying mechanism of the stomach of an individual whose duodenal bulb has been the seat of repeated ulceration and scarring. Nothing really new is being presented inasmuch as most of the details and concepts have been *hinted* at or actually described by many investigators from the time of William Beaumont onwards.

Why can such a simple expedient as intermittent suction or repeated lavage restore to normal the emptying time of a stomach which previously had apparently been completely obstructed?

It is a curious fact that prior to the advent of the x-ray, most of the older writers taught that the peristaltic contractions of the stomach travelled in a caudad direction from the cardia until they reached the beginning of the antrum. At this point a local contraction took place which divided the stomach in two parts. The distal pouch then contracted in a systolic fashion thereby emptying its contents into the duodenum. The mechanism was somewhat similar to what takes place in the stomach of a cow. The whole concept was based to a large extent upon the observations of Beaumont, Hofmeister and Schutz.

Fluoroscopic observations using the standard barium meal, however, did not seem to confirm this theory. L.G. Cole, using a serial x-ray film technic, apparently demonstrated that the peristaltic waves act upon the stomach as a whole thereby causing material to pass through the pylorus, which opened when the occasion demanded.

Later work employing motion pictures of the stomachs of experimental animals, and balloon studies in humans confirmed the fact that the peristaltic activity in the antrum is much greater and more purposeful than in the body of the stomach. Alvarez states that experimentally he has observed a typical contraction band in the region of the *incisura angularis*, followed by a systolic contraction of the antrum.

Anyone who has done a large amount of gastric fluoroscopy has noted that the deep active peristaltic waves start at the incisura and progress to the pylorus at the rate of 4 to 5 a minute. Particularly at the onset of the examination, these waves progress regularly and rhythmically and no emptying occurs. Suddenly barium will literally shoot into the duodenum and as far as the first part of the

---

\*Read before the First Annual Convention of the American College of Gastroenterology, Washington, D. C., 25, 26, 27 October 1954.



jejunum, indicating that there has been some change in the dynamics of the stomach, of the duodenum or both. Once in a while, at this point, it will be noted that the antrum takes on a ball-like appearance and seems entirely separate from the rest of the stomach.

There are two gastroscopic observations that shed some additional light. The pyloric orifice is open at all times except when a wave of peristalsis reaches it, at which time it closes momentarily. This is a constant observation with no exceptions. The second observation has to do with the appearance of the *inscisa angularis* and the presence of the *musculus sphincter antri* which is a raised, cord-like structure opposite the *inscisa* on the greater curvature side. These two structures make a distinct dividing point between the antrum and the body.

There is sufficient evidence to postulate that when the stomach ejects some of its contents through the pylorus, there is first a distinct band-like constriction at the beginning of the antrum which effectively divides the stomach into two parts. Then there is a combination of increased tonicity of the musculature of the antrum plus deep effective peristalsis.

The role of the pylorus is to prevent reflux, and this seems to be all. At the end of systole, when the peristaltic wave has reached the pylorus, it closes, thereby preventing the material in the duodenum from going back into the stomach. The duodenal cap plays an important role. Its walls are thinner and more easily distensible than the remaining portion of the first part of the duodenum. It is distended only when the ejection cycle takes place. Could it not be that it acts as a safety device to take up the greatly increased pressure within the duodenum and to somewhat equalize it with that in the stomach after the systole has relaxed?

It must be the state of receptivity of the duodenum which regulates the ejection cycle in the stomach. This organ, of necessity, must be ready to receive stomach contents before the stomach can eject it. At least the first two portions must be relatively empty and its walls relaxed or in a state of lessened tonus. How this signal is transmitted to the stomach proper is not definitely known. In all probability a hormonal messenger is the answer. Certainly it is not the pH of the duodenal contents as was thought for a long time, nor has it to do with the relative hydrostatic pressure.

In brief then, ejection of stomach contents takes place at irregular intervals by means of a systole of the antrum, which is influenced by the receptivity of the duodenum.

What happens when the duodenal bulb becomes the seat of repeated ulcerations? More and more scar tissue forms in its walls, gradually making it lose its elasticity and its capacity to expand. This part of the intraduodenal pressure regulatory mechanism begins to fail, resulting in an abnormal amount of reflux back into the antrum when the pylorus opens after antral systole. That is, the usual amount of gastric contents passes through the pylorus with systole, raising the



hydrostatic pressure abnormally in the duodenum, so that when the pylorus opens a relatively large amount regurgitates. There is an analogy in this situation with a stenosed and incompetent heart valve.

In addition, the scarring process reduces the effective lumen of the bulb and the postbulbar area, so that greater force is required to get the same amount of gastric contents through this area in the same length of time. This requires the antrum to contract more forcefully and more rapidly. Unlike the heart, however, the walls of the stomach do not hypertrophy in response to an increased work load.

At this point, then, we have a situation in which the capacity of the stomach to empty itself is chronically overloaded, but it still manages to do its job.

If now the wall of the first portion of the duodenum becomes irritable, that is, if its ability to lessen its tonus becomes affected, either by direct irritation or through nervous influences, then still another load is thrown in the stomach. It then becomes incompetent; that is, it does not empty before more food enters by way of the esophagus. If then the individual lessens the work load by decreasing the amount of food he puts into his stomach, or changes its character or consistency, then this decompensated stomach may function for a time in an apparently normal fashion. If the pathological process in the duodenum progresses slowly and the patient continues to ingest sufficient food to maintain the metabolic needs of his body, something has to happen. Dilatation commences, to compensate for the accumulated amount of ingested material. With dilatation comes loss of tone, and with loss of tone an incompetence of the band-like division at the *angulus-musculus sphincter antri* area. When this happens the fluid material in the antrum is pushed both cephalad and caudad, instead of only caudad. This lessens the effective pressure at the pylorus, allowing less material to enter the duodenum. This process is slowly progressive; a certain amount of pyloric contents going into the duodenum, but more and more being retained or regurgitated into the antrum. A vicious cycle begins; dilatation and more incompetence. Finally, the stomach becomes a mere *flaccid* bag.

Why does intermittent suction or repeated lavage frequently cause a return to apparent normal emptying? The answer is not too difficult. This form of therapy removes the retained gastric contents and allows for a return of muscular tone and competence of the emptying mechanism. To a certain extent vomiting does the same thing, although not too efficiently.

The clinical picture of pyloric stenosis is not due to an actual closing off of the pyloric valve, but first to a relative incompetence of its action and secondarily to a failure of the systole of the antrum. A return of function, affected by suction or lavage, does not mean that the underlying pathology has changed for the better. The idea of there being edema of the duodenal mucosa, which is relieved, does not fit into this concept and it is doubted that this complication plays any

part. Even in a stomach that appears completely obstructed, enough food usually gets into the intestinal tract to maintain the individual's nutrition.

Thinking along these lines it is easy to see why a *pyloroplasty* does not always accomplish what it is supposed to. Merely enlarging the pyloric orifice does not correct all the factors involved. A great deal of the operation's success would depend upon the site of the ulcer's scarring.

Also, it is not difficult to explain why a simple gastroenterostomy oftentimes effects a complete cure. The artificial stoma drains off the excess material from the stomach and acts in this way much like intermittent suction. It can do this because there is considerable difference between the receptivity of the jejunum and that of the first portion of the duodenum. A well functioning gastroenterostomy usually encourages the re-establishing of normal emptying through the pylorus. The proper placing of the stoma is probably proximal to the *musculus sphincter antri*.

The beneficial results of subtotal resection require a little different explanation. The best results are obtained when three-quarters or more of the stomach is removed. If the stoma is made into a loop of jejunum, then emptying takes place by a combination of gravity, easy receptivity of jejunum, contractions of the abdominal wall musculature, and by the variations in tonicity of the stomach itself.

When the cut end of the duodenum is anastomosed to the cut end of the stomach the systole of the antrum is of course missing. The small size of the remaining portion, however, allows relatively small increases in tonicity and rather weak peristalsis to produce sufficient increased intragastric pressure to effect emptying when the duodenum is in a receptive state.

In summary then, the stomach empties itself by means of an actual systole of the antrum at a time when the first portions of the duodenum are in a receptive state. The clinical picture of pyloric stenosis is produced by an incompetence of this systole rather than an actual closure of the pyloric orifice.

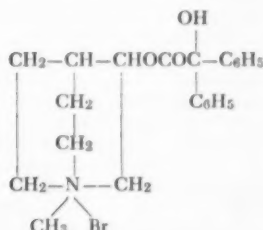
# CLINICAL AND ROENTGENOLOGICAL EFFECTS OF A NEW ANTICHOLINERGIC IN GASTROINTESTINAL DISEASE\*

A. X. ROSSIEN, M.D., F.A.C.G.†

Kew Gardens, N. Y.

The introductions of new anticholinergic medications<sup>1,4-11</sup> into the treatment of organic and functional gastrointestinal disorders have had a favorable influence upon associated hyperperistalsis, spasms and hypersecretion. Investigations of anticholinergic drugs continue towards the establishment of their improved selection for activity and elimination of side effects.

The report herein presented is a clinical and roentgenological evaluation of a new anticholinergic preparation, Marplan bromide‡, having the chemical name, 1-methyl-1-3-benzoyloxy-quinuclidinium bromide. This was formerly known as Ro 2-3773. For the purposes of brevity this shall be referred to as Marplan. The structural formula is:



A laboratory comparative study<sup>2</sup> of Marplan and methantheline reveals that when given intravenously to mice the toxicity of the former is only about one-third that of the latter. Animal experimentation<sup>2</sup> indicated that Marplan is primarily intended for disorders of the gastrointestinal tract associated with hypermotility and spasticity. Floody<sup>3</sup> deduced from what he considered adequate exploration of human pharmacology by Ingelfinger, Stewart Wolf and Mendeloff that for clinical investigations Marplan should be used in dose levels varying between 5 to 10 mg. t.i.d. or q.i.d. He further suggested an initial dose of 7.5 mg. t.i.d. or q.i.d.§

## CLINICAL MATERIAL

Twenty-seven patients were included in this investigation. The group consisted of 19 males varying from 22 through 64 years of age and of 8 females varying

\*Supplied by Hoffmann-La Roche Inc., Nutley, N. J.

†Assistant Clinical Professor of Medicine, New York Medical College; Attending Gastroenterologist, Triboro Hospital of Queens General Medical Center, Jamaica, N. Y.

‡Marplan® bromide, the Hoffmann-La Roche brand of clidinium bromide.

§Data received subsequent to the drafting of this report suggest that doses of 5.0 mg. t.i.d. or q.i.d. are usually adequate and evoke fewer and milder side-effects.

TABLE I

Case No.	Clinical and X-ray Diagnosis	Improved		Pylorospasms	
		Clinically	X-ray	Before	After
1	Acute antral gastric ulcer.	Y	N	Y	N
2	Chronic duodenal cap ulcer with chronic antral gastritis.	N	N	Y	Y
3	Functional spasms of gastrointestinal sphincters.	N	N	Y	Y
4	Redundant gastric mucosa and Resultant pylorospasms.	Y	Y	Y	Y
5	Chronic duodenal cap ulcer.	Y	Y	Y	Y
6	Duodenitis and spasms of gastrointestinal sphincters and pylorospasms (funct.).	N	N	Y	Y
7	Functional gastrointestinal sphincter spasms and constipation.	Y	Y	Y	Y
8	Acute duodenal cap ulcer.	Y	Y	Y	N
9	Chronic duodenal cap ulcer and chronic gastritis.	Y	Y	Y	Y
10	Transitory hiatus hernia that previously bled.	Y	N	Y	Y
11	Chronic duodenal cap ulcer.	N	Y	N	N
12	Enteritis—etiology undetermined (sprue-like syndrome).	Y	N	N	Y
13	Jejunal side stomal ulcer in subtotal gastrectomy.	N	N	Stomal spasm.	Stomal spasm.
14	Chronic duodenal cap ulcer and chronic gastritis.	Y	Y	Y	Y
15	Enteritis—etiology undetermined (sprue-like syndrome).	N	Y	N	N
16	Chronic duodenal cap ulcer.	Y	N	N	Y
17	Chronic duodenal cap ulcer.	N	N	N	Y

Key: N—No; Y—Yes

TABLE I (continued)

Case No.	Clinical and X-ray Diagnosis	Improved		Pylorospasms	
		Clinically	X-ray	Before	After
18	Redundant and protruding gastric mucosa and antral gastritis.	Y	N	Y	Y
19	Chronic duodenal cap ulcer.	N	N	N	Y
20	Pyloroduodenal ulcer with antral gastritis.	Y	Y	Y	N
21	Gastrointestinal allergy and enteritis—etiology undetermined (sprue-like syndrome).	N	N	Y	Y
22	Chronic duodenal cap ulcer.	N	Y	N	N
23	Slight gastritis in subtotal gastrectomy.	Y	N	Stomal spasm.	Stomal spasm.
24	Duodenal cap ulcer symptom complex.	N	N	Y	Y
25	Chronic antral gastritis with prolapsed mucosa.	Y	N	Y	Y
26	Chronic duodenal cap ulcer.	Y	N	Y	Y
27	Chronic antral gastritis with prolapsed gastric mucosa.	Y	N	Y	Y

Key: N—No; Y—Yes

Note that 16 patients were clinically improved and 10 patients presented roentgenological evidence of improvement within 10 days of treatment. Pylorospasms were slightly increased during this period.

from 19 through 57 years of age. The youngest patient was a female. There were 3 males in the 20 through 29-year age group; 5 males and 3 females in the 30 through 39-year age group; 8 males and 1 female in the 40 through 49-year age group; 1 male and 3 females in the 50 through 59-year age group; 2 males in the 60 through 64-year age group. The mean age of the males and females was 43 and 38 years respectively.

Clinical and roentgenological studies led to the diagnoses of 2 gastric ulcers; 12 cases of duodenal cap ulcers; prolapsed gastric mucosa in 4 patients; 3 with idiopathic sprue and functional gastrointestinal sphincter spasms in 3 patients. One patient had a transitory hiatus hernia. Two patients had previously been subtotally gastrectomized; one of these had a jejunal side stomal ulcer and the other had a mild gastritis but both presented stomal spasms.

The symptomatology will be discussed under "*observations*" where the initial and residual or resultant symptoms will be presented.

#### PROCEDURE

A detailed history and physical examination was carried out on each patient. Special emphases were placed before and after treatment on the symptoms which are recorded in Table IV. The gastrointestinal tract was studied via roentgenoscopy and roentgenography before and after treatment.

TABLE II

Case No.	Caustic Residue at 3 Hours		Head of Barium Column at 3 Hours		Tail of Barium Column at 3 Hours	
	Before	After	Before	After	Before	After
1	N	Y	Mid-ascend. colon	Prox. ile.	Dist. jej.	Stomach
12	N	Y	Dist. Trans. colon	Cecum	Dist. ile.	Stomach
15	N	N	Dist. ascend. colon	Mid-ile.	Dist. jej.	Prox. jej.
16	N	Y	Dist. ile.	Prox. ile.	Dist. jej.	Stomach
17	Y	Y	Mid-ascend. colon	Dist. ile.	Stomach	Stomach
19	N	Y	Mid-ascend. colon	Mid-ile.	Duo. cap	Stomach
20	Y	N	Cecum	Prox. ile.	Stomach	Prox. jej.
21	Y	Y	Mid-ile.	Dist. jej.	Stomach	Stomach
24	N	Y	Mid-descend. colon	Cecum	Prox. jej.	Stomach
27	N	Y	Mid-ile.	Prox. ile.	Dist. jej.	Stomach

Note that the incidence of gastric residue at the third hour is increased from 30 to 80% after using the anticholinergic. The barium column motility is decreased in the small intestines. (N—No; Y—Yes)

There was uniformity of treatment. The patients were given the same bland diet. A reliable brand capsule of B-complex with Vitamin C was ordered to be taken b.i.d. Marplan, in 7.5 mg. doses, was to be taken four times per day at six hour intervals. This course of treatment was continued for ten days during which time the patients were to abstain from other medications and other food. No procedures were permitted for relief of constipation. All patients were ambulatory.

The usual preparations for upper gastrointestinal tract x-ray studies were observed except that the post-treatment x-ray investigations were started three

TABLE III

Case No.	Caustic Residue at 6 Hours		Head of Barium Column at 6 Hours		Tail of Barium Column at 6 Hours	
	Before	After	Before	After	Before	After
1	N	N	Hep. flex.	Mid-ile.	Dist. ile.	Dist. jej.
2	N	Y	Cecum	Dist. ile.	Mid-ile.	Stomach
3	N	N	Dist. ile.	Mid-ile.	Prox. ile.	Dist. jej.
4	N	N	Mid-ile.	Mid-ile.	Prox. ile.	Dist. jej.
5	N	Y	Dist. trans. colon	Dist. ile.	Cecum	Stomach
6	N	N	Mid-ile.	Mid-ile.	Mid-ile.	Mid-jej.
7	N	N	Mid-trans. colon	Prox. ile.	Dist. ile.	Dist. jej.
8	N	N	Mid-trans. colon	Mid-ile.	Cecum	Dist. jej.
9	N	N	Dist. trans. colon	Mid-ile.	Dist. ile.	Dist. jej.
10	N	N	Mid-trans. colon	Prox. ile.	Dist. ile.	Dist. jej.
11	N	N	Dist. trans. colon	Mid-ile.	Cecum	Prox. ile.
12	N	N	Dist. descend. colon	Prox. ascend. colon	Cecum	Dist. ile.
13	N	Y	Hep. flex. of colon	Dist. jej.	Dist. ile.	Stomach
14	N	N	Splen. flex. of colon	Dist. ile.	Cecum	Duo. cap
15	N	N	Mid-trans. colon	Cecum	Dist. ile.	Prox. jej.
16	N	Y	Mid-ascend. colon	Mid-ile.	Prox. ile.	Stomach
17	N	Y	Rectum	Dist. ile.	Dist. ile.	Stomach
18	N	Y	Dist. descend. colon	Prox. ile.	Dist. ile.	Stomach
19	N	N	Prox. trans. colon	Mid-ascend. colon	Dist. ile.	Duo. cap
20	N	N	Rectum	Mid-ascend. colon	Dist. ile.	Dist. ile.
21	N	N	Splen. flex. of colon	Dist. ile.	Dist. ile.	Prox. jej.
22	N	Y	Splen. flex. of colon	Mid-trans. colon	Dist. ile.	Stomach
23	N	N	Cecum	Mid-ile.	Dist. ile.	Prox. jej.
24	N	Y	Rectum	Mid-ascend. colon	Dist. jej.	Stomach
25	Y	Y	Dist. descend. colon	Mid-trans. colon	Stomach	Stomach
26	N	Y	Rectum	Cecum	Cecum	Stomach
27	N	N	Hep. flex. of colon	Dist. ile.	Dist. ile.	Duo. cap

Note that the incidence of gastric residue at the sixth hour is increased from 3.7% to 37% after using the anticholinergic. The head of the barium column reached the rectum in four cases before and not in any beyond the mid-transverse colon after the medication was used. (N—No; Y—Yes)



hours after each patient had swallowed 7.5 mg. of Marplan with a sip of water. Only ten of the patients were available for small intestine serial studies through the 3-hour period; all reported for the 6-hour x-ray surveys.

#### OBSERVATIONS

(a) *Symptomatology*:—Eleven patients experienced hunger-pain at the onset of the study. Ten days later, at the completion of treatment, seven patients were completely free of that symptom while the remaining four patients had a marked reduction in the intensity and recurrence of their-hunger pain. Eight of the 11 were peptic ulcer cases. The diagnoses of the remaining three (Cases 18, 21, and 23) are listed in Table I. Fourteen patients complained of other vague mild abdominal pain; at the end of treatment nine patients had the same complaint. Epigastric fullness and pressure was present in 17 patients before, and in 16 after treatment.

Nausea was a symptom in five and three patients respectively before and after the Marplan treatment. At no time was vomiting a presenting symptom.

Heart-burn was a complaint made by six cases at the onset and by 13 after the ten-day testing period. Nine patients experienced localized epigastric burning at first but only four had this complaint at the end of their studies. Belching was present in 13 and eight patients respectively before and after the investigations.

Five patients had diarrhea at the beginning of their studies; two continued to have this symptom after their ten-day surveillance while using the anticholinergic medicament. Of the ten patients who were constipated before this study only one became free of this symptom but the other nine became more constipated. Eleven others developed this symptom to a moderate degree during the period of investigation. Fifteen cases complained of passing flatus in excess before and after the treatment. Seven and two patients respectively before and at the completion of this study complained of passing mucus in the feces.

Clinical evaluations based upon patients' impressions are at best not too reliable. Subjective symptomatology, however, cannot be approached otherwise.

No patients stated that they began to develop hunger-pain during this survey. Nevertheless, of the other symptoms the following was noted:

- (1) Some of the patients that did not have certain symptoms before treatment developed them during the study.
- (2) Some of the symptoms increased while others decreased in intensity.
- (3) Some of the patients were completely relieved of some of their symptoms.

The *overall* impression gained from this series of 27 cases was that 59 per cent (16 patients) were *clinically* improved. Eight of these patients had peptic



TABLE IV

Case	Sex	Age	H-P		OAP		H-B		Nau.		Bel.		EFP		Vom.		E-B		P-M		E-F		Con.		Dia.	
No.		Yrs.	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
1	M	30	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	N	N	N	Y	N	Y	N	N
2	M	61	N	N	N	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	Y	N	N
3	F	50	N	N	Y	Y	N	Y	N	N	Y	N	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	N	N
4	M	41	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N
5	F	37	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N
6	M	44	N	N	Y	Y	N	Y	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	Y	Y	N	Y	N
7	M	23	N	N	N	N	N	Y	N	N	N	N	Y	Y	N	N	Y	N	Y	N	Y	N	Y	Y	N	N
8	F	19	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	Y	N	N
9	F	39	Y	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	N
10	M	37	N	N	Y	N	N	N	N	N	Y	N	Y	N	N	N	N	N	Y	N	N	Y	N	Y	N	N
11	F	42	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	Y	N
12	M	22	N	N	Y	Y	N	N	N	N	Y	N	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	Y
13	M	39	N	N	Y	N	N	Y	Y	N	N	Y	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	N	N
14	F	51	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N	N
15	M	45	N	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	Y
16	F	57	Y	Y	Y	Y	N	Y	N	N	N	N	Y	Y	N	N	Y	N	Y	N	N	N	N	Y	N	N
17	M	44	N	N	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N
18	M	35	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	N	Y	N	N
19	M	37	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y	N	N
20	M	46	Y	N	N	N	N	Y	N	N	N	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	N
21	F	31	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	N	N
22	M	42	N	N	N	N	N	Y	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N	Y	N
23	M	46	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	Y
24	M	57	Y	N	N	N	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	N	Y	N	N
25	M	47	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Y	N
26	M	64	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
27	M	26	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N

## Key:

H-P—Hunger-pain

OAP—Other abdominal pain

H-B—Heart-burn

Nau.—Nausea

Bel.—Belching

EFP—Epigastric fullness and pressure

Vom.—Vomiting

E-B—Epigastric-burning

P-M—Passage of mucus

E-F—Excessive flatus

Con.—Constipation

Dia.—Diarrhea

B—Before treatment

A—After the 10-day treatment

N—No

Y—Yes

Note that six of the seven patients that were relieved of hunger-pain were peptic ulcer cases. The incidence of heart-burn increased by slightly more than double while epigastric burning was relieved by a similar ratio. Diarrhea was reduced by slightly more than 50%. Constipation was markedly increased. (10 cases at the onset and a total of 20 at the completion of the study.)

ulcers. There having been a total of 15 peptic ulcer cases, their clinical improvement is 53.3 per cent in the 10 day trial period. Seven (46.6 per cent) of these peptic ulcer patients showed roentgenologic evidence of improvement at this same period.

(b) *Roentgenology*:—The ten-day Marplan trial period was, as previously mentioned, preceded and immediately followed by upper gastrointestinal tract fluoroscopy and roentgenography. Three hours before the second x-ray study was started each patient had swallowed 7.5 mg. of the anticholinergic drug.

Patients were considered as having pylorospasms if, in the absence of actual organic pyloric obstruction, there was a five minute or greater delay in the starting of the passage of the barium meal into the duodenum. Twenty-five of the patients presented slight variation in the presence of pylorospasms. Eighteen of these patients (72 per cent) had pylorospasms before and 19 (76 per cent) had the spasms at the end of this investigation. Both of the subtotaly gastrectomized patients had stomal spasms before and after treatment; their post-treatment spasms were more marked.

Only ten patients were available for the 3-hour x-ray study. A 3-hour gastric residue was present in 30 and 80 per cent of the patients respectively at the start and finish of the survey. Gastric residue was observed at six hours in one patient (3.7 per cent) before starting the Marplan experiment and in ten patients (37 per cent) after its completion.

At the third hour the head of the contrast media varied in position from the mid-ileum to within the mid-descending colon before administration of the drug. At the end of the tenth day of investigation, its position at the same period was observed as varying from the distal jejunum to within the cecum. The 6-hour studies revealed that the head of the contrast media had reached positions from between the mid-ileum to through the rectum before the anticholinergic medication was used; at the completion of treatment the positions varied from the distal jejunum to within the mid-transverse colon.

The *overall* impression gained was that ten patients (37 per cent) presented *roentgenological* evidence of organic disease improvement in this short period of investigation. It is a well established fact that a diseased organ will generally develop a favorable *clinical* response to a medicament before healing evidence is observed on *x-ray* study.

(c) *Side-effects*:—Four of the 27 patients stated that they experienced a feeling of well being while taking Marplan. The euphoria began to subside, however, at about the eighth day and disappeared soon after treatment was terminated. Headaches developed in three patients during the investigation. Two patients complained of having "dry stools" while using the anticholinergic drug. One patient experienced polyuria and excessive perspiring; one had "tingling of the

TABLE V

Case No.	Dryness of Mouth	Blurring of Vision	Constipation	Difficulty on Starting Urinary Stream	Feeling of Well-being	Headaches	Miscellaneous Unwanted Effects
1	Y	N	Y	N	Y	N	N
2	N	N	Y	Y	N	N	N
3	Y	N	Y	N	N	N	Nervousness
4	Y	Y	N	N	N	N	Sweating-Polyuria
5	Y	N	Y	N	N	N	Dry stool
6	N	N	Y	N	N	N	N
7	Y	N	Y	N	N	N	Dry stool
8	Y	Y	Y	Y	N	Y	N
9	Y	Y	Y	Y	N	N	N
10	Y	Y	Y	N	N	N	N
11	N	N	Y	N	N	N	Less allergic dermatitis of hands
12	Y	N	N	N	N	N	N
13	Y	Y	Y	Y	N	N	N
14	Y	Y	Y	Y	Y	N	N
15	Y	Y	N	N	Y	Y	Tingling of finger tips
16	Y	N	Y	N	N	N	N
17	Y	Y	Y	Y	N	N	N
18	Y	Y	Y	Y	N	N	Vertigo
19	Y	Y	Y	Y	N	Y	N
20	Y	Y	N	Y	N	N	N
21	Y	Y	N	Y	Y	N	N
22	Y	N	Y	Y	N	N	N
23	Y	Y	Y	Y	N	N	N
24	Y	N	Y	Y	N	N	N
25	Y	N	N	Y	N	N	N
26	Y	N	N	N	N	N	N
27	Y	N	Y	N	N	N	N

The side-effects experienced by the patients during the investigation are listed above and were of varying degrees. (N-No; Y-Yes)

finger-tips"; another developed vertigo shortly after each dose of Marplan. One patient complained of "becoming nervous". A patient who had had an allergic dermatitis of the hands for many years stated that the dermatitis was much less marked while the medicament was used.

One could hardly consider all of the aforementioned patients' observations as necessarily being side-effects of the drug under investigation. Some of the symptoms undoubtedly had psychogenic bases while others had their origins elsewhere.

Dryness of the mouth was developed by 24 patients (88.8 per cent). The xerostomia was mild in 15 of these 24 cases. Fourteen patients (51.8 per cent) developed varying degrees of difficulty on starting their urinary streams. Mydriasis was present during this study in 13 patients (48.1 per cent) with the resultant blurring of vision being most troublesome to five of these cases. As previously mentioned, 20 cases (74 per cent) either developed constipation or their pre-existing constipation became more marked.

#### CONCLUSIONS AND COMMENTS

This report is a clinical and roentgenological evaluation of a new anticholinergic drug. The comparisons made are between pre- and post-treatment observations. Controlled comparative studies with other anticholinergic drugs are now in process and will be reported at their completion. There was no intent to evaluate the effects in any one particular gastrointestinal disease. Further, comparing the herein reported findings with those of other investigators of different anticholinergics would be inconclusive unless similar standards for study had been observed.

The author acknowledges the fact that a ten-day evaluation period is too short for final conclusions. Hence, no final conclusions are intended. The observations made, however, indicate that Marplan is an anticholinergic that merits being included among the efficient group of similar drugs.

The resistance of patients to the side-effects of anticholinergics had been generally observed as tending to increase with their usage. Longer periods of investigations with Marplan should lead to similar results.

The motility of the gastrointestinal tract is definitely reduced by this medication. Further, the findings imply that it should be efficacious in the treatment of diarrhea and also in the "dumping-syndrome" of subtotally gastrectomized patients.

The clinical (53.3 per cent) and roentgenological (46.6 per cent) improvements of the peptic ulcer cases in the brief (ten-day) trial period is encouraging and bears further investigation.

## SUMMARY

1. Twenty-seven patients were observed while under treatment with a new anticholinergic drug, Marplan bromide.

2. The side-effects were not excessive or severe, despite a dosage level higher than that in common use.

3. The observations were found to be encouraging.

4. The medicament merits being included among the efficient group of anticholinergic drugs.

*Acknowledgements:*—The author wishes to express his appreciation to Sarah E. Worob, M.D. and Miss Patricia H. Carroll for their technical assistance in this study and preparation of this paper.

## REFERENCES

1. Bolt, R. J., Bratt, H. and Pollard, H. M.: Action of a New Synthetic Antispasmodic in Patients with Gastrointestinal Complaints, *Gastroenterology*, **24**:204, (June), 1953.
2. Departments of Pharmacology and Clinical Research, Hoffmann-La Roche Inc., Nutley 10, New Jersey.
3. Floody, R. J., Personal Communications, March 2, 1953 and April 20, 1953.
4. Grimson, K. S., Lyons, C. K. and Reeves, R. J.: Clinical Trial of Banthine in 100 Patients with Peptic Ulcer, *J.A.M.A.*, **143**:873, (July 8), 1950.
5. Heineken, T. S.: An Evaluation of Prantal® in Ulcer Management, *Rev. Gastroenterol.*, **20**:829, (Nov.), 1953.
6. Ingegno, A. P. and Kertzner, L.: Effects on Gastric Secretion of W I N 4369 (Monodral), a Synthetic Anticholinergic, *N. Y. State J. Med.*, **54**:1185 (April 15), 1954.
7. Mattman, P. E. and Strutner, L.: Preliminary Evaluation of a New Drug, Antrenyl. Effect on Gastric Secretion, Motility and Results in the Symptomatic Care of Peptic Ulcer, *Am. J. Digest. Dis.*, **20**:126, (May), 1953.
8. McKenna, R. D., Smith, S. A. and Wyse, D. M.: The Effects of Newer Antisecretory Compounds on Gastric Secretion and Motility in Man and Dogs, *Gastroenterology*, **26**:476, (March), 1954.
9. Roback, R. A. and Beal, J. M.: Effect of a New Quarternary Ammonium Compound on Gastric Secretion and Gastrointestinal Motility, *Gastroenterology*, **25**:24, (Sept.), 1953.
10. Schwartz, S. A. and Bauer, H. G.: A Preliminary Study of the Therapeutic Action and Toxicity of an Anticholinergic (3 Diethylamino-1-Cyclohexyl-1-Phenyl-1-Ethiodide), *Rev. Gastroenterol.*, **20**:913, (Dec.), 1953.
11. Shutkin, M. W.: The Medical Treatment of Peptic Ulcer with a New Anticholinergic Compound, *Am. J. Gastroenterol.*, **21**:386, (May), 1954.

## MUCOCELE OF APPENDIX SUPERIMPOSED BY ACUTE SUPPURATIVE INFLAMMATION

SAUL ALFRED RITTER, M.D., F.A.C.S.

and

ALFRED HAAS, M.D., F.I.C.S., F.A.C.G.

New York, N. Y.

Mucocele of the appendix is a relatively uncommon degenerative lesion resulting from occlusion of its lumen secondary to recurrent inflammation or neoplasm.

The case herewith reported is extremely unusual because the mucocele was very large and was secondary to chronic inflammation superimposed by acute suppurative inflammation.

Obstruction of the lumen of the appendix, either because of recurrent inflammation or tumor, causes distention or "ballooning-up" by the accumulation and stagnation of its mucus secretion. Its wall may become hypertrophied, fibrosed and thinned-out in places. When perforation occurs in these cases *pseudomyxoma peritonei* may ensue.

Wells<sup>1</sup>, was able to induce, experimentally, the formation of mucocele in rabbits, by ligating the base of the appendix, but essentially without impairing the appendiceal circulation. He infers that recurrent appendicitis and submucosal fibrosis produce stricture of the lumen of the appendix at some point and the subsequent accumulation of mucus secretion produces intraluminal pressure and distention with secondary degeneration of its wall. He also reported a case of mucocele of the appendix occurring secondary to endometriosis, involving the wall of the cecum near the base of the appendix causing obstruction of its lumen and secondary mucocele.

In 1949, Shemilt<sup>2</sup>, published a case of endometrioma of the cecum causing mucocele of the appendix.

Grodinsky and Rubnitz in 1949<sup>3</sup>, reported that they had experimentally induced mucocele formation of appendix in rabbits. They also successfully produced *pseudomyxoma peritonei* by injecting contents of mucocèles and also emulsions of mucocèles containing lining cells into the peritoneal cavity of other rabbits. They question "whether the secondary deposits are actual transplants of viable cells or the result of stimulation or irritation *in situ*".

At the Mayo Clinic, Mayo and Fauster<sup>4</sup>, reported that mucocele was found in 0.24 per cent of all cases in which appendectomy had been performed from 1917 to 1930.

Woodruff and McDonald<sup>5</sup>, suggest the terms benign and malignant mucocoele. They reported 10 of the latter from the Mayo Clinic out of 146 appendiceal mucocoeles. They maintain that *pseudomyxoma peritonei*, secondary to appendiceal origin, occurs only with malignant mucocoele.

Hilsabeck, Judd and Woolner<sup>6</sup>, reported 29 cases of "malignant mucocoele" of the appendix associated with carcinoma. They classify primary adenocarcinoma as being of three distinct types: 1. Carcinoid type. 2. Cystic or malignant mucocoele type. 3. Colonic type. It is in this latter group that they had 12 such cases. They maintain that "their true incidence is difficult and not possible to determine because these carcinomas involve the cecum early".

Carcinoid tumor of the appendix occurs not infrequently. It is described by Boyd<sup>7</sup>, as a low grade malignant neoplasm which invades the wall and rarely metastasizes to the regional lymph nodes. He says that "the lesion is never known to be fatal". Appendectomy is usually curative.

When carcinoid arises in the intestine, however, it is more malignant and more often metastasizes to the regional lymph nodes and liver. It may even cause intestinal obstruction. Lewis<sup>8</sup>, states that patients with distal metastases in these cases have been known to have lived for long periods of time. Occasionally, however, rapid progression and wide dissemination and death may result. He suggests radical extirpation of the primary lesion, regional mesenteric lymph nodes and independent metastases.

Our case is reported herewith because it is extremely unusual. The mucocoele was very large and its formation was secondary to chronic inflammation. The lesion became the seat of acute purulent appendicitis and was diagnosed the latter. The actual lesion was only revealed at operation.

*History:*—Patient, F.L., a 65-year old, white female was admitted to Doctors' Hospital in New York City, case #59793, on February 28, 1948, with a history of nausea, vomiting and agonizing pains in the right lower quadrant of the abdomen for about 26 hours.

Her past history revealed that for ten years she had received medical treatment for hypertensive cardiovascular disease. No other relevant facts could be ascertained.

*Physical Examination:*—Patient was acutely ill. There was tenderness, rebound tenderness and the onset of rigidity over McBurney's point. No abdominal mass was palpable.

The heart was slightly enlarged and a systolic murmur was audible. An occasional moist rale was noticed over the bases of the lungs. The pulse was 90 and the temperature was 102 degrees. The blood pressure was 180/100. Pelvic examination revealed no unusual findings.



*Laboratory Findings:*—Leucocyte count was 17,200 with 86 per cent polymorphs. Examination of the urine was negative.

The clinical diagnosis was acute appendicitis.

*Operation:*—Laparotomy was performed shortly after admission. The peritoneum was congested and the cecum inflamed. The appendix was found to be grayish-white in color, enormously enlarged, the shape and size of a sausage. The serous surface was covered with fibrinopurulent exudate. Its wall was markedly hypertrophied and thinned-out in places, but not perforated. It was connected with the cecum by a shrunken, distorted mesoappendix. The uterus and adnexa were atrophic. No other lesion was visible. An appendectomy was performed by a "V" shaped excision out of the cecal wall. The cecum was closed with two layers of sutures.



Fig. 1—Cut section of mucocoele of appendix revealing marked hypertrophy of the wall, thinned-out in places, cavity markedly distended containing mucus and necrotic grumous material.

The patient became somewhat disoriented for short periods during the first few days postoperatively. Otherwise she made an uneventful recovery.

*Report of Specimen:*—Gross (Fig. 1): A huge appendix  $8\frac{1}{2}$  cm. long and  $3\frac{1}{2}$  cm. wide covered with fibrinopurulent exudate. On cut section, the wall was markedly hypertrophied but thinned-out in places. Its lumen was dilated and contained a large amount of mucinous and grumous necrotic material.

Microscopic examination by Dr. Muller revealed evidences of diffuse acute and chronic inflammation (Fig. 2).

On grossly cut section, the wall was markedly hypertrophied and in places thinned-out and friable. We suspected the possible presence of carcinoid tumor



and therefore cut large tangential sections from different areas of the specimen and submitted them to Dr. Karl T. Neubuerger for special pathological study with silver impregnation stains. His report, herewith, only confirmed the previous findings of acute and chronic inflammation. No evidence of tumor was found.

#### PATHOLOGICAL REPORT

General Rose Memorial Hospital, Denver, Colorado. Tissue Pathology. Path. specimen no. S-1176-F. Patient FL.

*Clinical Diagnosis:*—Mucocele of appendix.

*Nature of Specimen:*—Same.

*Gross:*—The specimen consists of two pieces of appendiceal wall; one measures 4 x 1 x .5 cm. and the other 2 x 1 x .3 cm. The outer surface is dull, yellowish and coated with fibrin. The wall is thickened, firm grayish to light brown, with distinct layering. The mucosal surface is roughened, shaggy and yellowish.

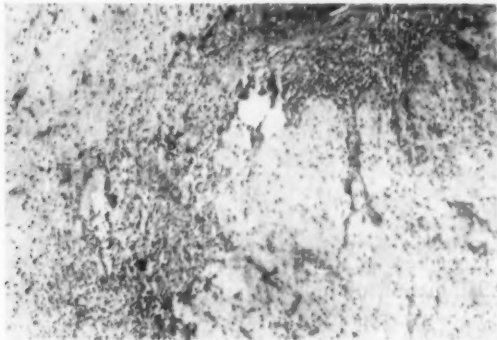


Fig. 2—Photomicrograph of cut section revealing acute and chronic inflammation.

*Microscopic:*—Longitudinal sections of the appendix present a rather complicated picture. The mucosa has sloughed off in many places but elsewhere the mucosal glands are fairly well preserved. They are few in number and widely separated. The intervening tissue is loose and edematous and infiltrated with lymphocytes, occasional eosinophiles and polymorphs. The number of lymph follicles is greatly reduced. The submucosa is much thicker than normal, edematous and vascular, with occasional hemorrhages. Fibrinoid swelling of the connective tissue is noted. The vascular walls are swollen and likewise show fibrinoid degeneration. Patches of fat are interspersed. Infiltration with inflammatory cells is present and rather marked. The cells are lymphocytes, polymorphs and occasional eosinophiles. In several places, especially toward the periphery of the submucosa, polymorphs are rather densely amassed and mingled with fibrinous material. The muscularis is relatively well preserved and shows little inflammatory

involvement. In one of the blocks, cholesterol crystals are seen within inflammatory exudate close to the ulcerated mucosal surface. The glands in the vicinity are greatly distorted. In another field a cavity with poorly preserved lining is found. In only a few places there are cells resembling those of normal mucosa. Elsewhere this cavity is surrounded by a band of connective tissue with fibrinoid swelling mingled with polymorphs. The cavity contains mucoid material with dense aggregations of white blood cells mainly polymorphs. Nodular infiltrates consisting of plasma cells and lymphocytes are found in the vicinity. The cavity is located in the submucosa. Evidence of neoplastic tissue is not found in the material available. In one area groups of large cells close to the cavity are seen; these cells prove to be very large plasma cells under high magnification.

*Diagnosis:*—Appendicitis, acute to subacute, diffuse. Mucocele, appendix. Signed, Karl T. Neubuerger, M. D.

#### SUMMARY

It is not often possible to make the diagnosis of mucocele of appendix preoperatively even if the mass is not very large, especially in the presence of acute infection and with abdominal rigidity.

Peritoneoscopy was effectively used by Chaffee and Le Grande<sup>9</sup>, to diagnose preoperatively a case of *pseudomyxoma peritonei*, secondary to perforated mucocele.

All cases of mucocele of appendix, when not perforated, are curable by appendectomy.

An unusual case is herewith reported in which there was a mucocele, secondary to chronic inflammation of the appendix, supervised by acute gangrenous appendicitis. The patient was cured by appendectomy.

#### REFERENCES

1. Wells, A. Q.: Brit. J. Surg. **24**:766, 1937.
2. Shemilt, P.: Brit. J. Surg. **37**:118, 1949.
3. Grodinsky, M. and Rubnitz, A.: Surg., Gynec. & Obst. **73**:354, 1941.
4. Mayo, C. and Fauster, J.: Minn. Med. **15**:254, 1932.
5. Woodruff, R. and McDonald, J.: Surg., Gynec. & Obst. **71**:750, 1940.
6. Hilsabeck, J. R., Judd, E. S. and Woolner, L. B.: S. Clin. North America. **31**:995, 1951.
7. Boyd, William: Surgical Pathology, W. B. Saunders Co., Phila., Pa. 1947, p. 302.
8. Lewis, F., in Dean, Practice of Surgery: W. F. Prior, Inc. Hagerstown, Md., 1929, V. 6, p. 39.
9. Chaffee, J. S. and Le Grande, R. H.: Arch. Surg. **45**:55, 1942.

## THE DOUBLE GALLBLADDER: A CONGENITAL ANOMALY

### REPORT OF NINE CASES

A. GALAMBOS, M.D.

and

W. M. GALAMBOS, M.D.

New York, N. Y.

The double gallbladder, probably the most important among the congenital anomalies of this viscus is a very rare observation. Until 1936 not more than 28 cases were collected from the entire literature (Gross). The majority of them, clinically undiagnosed, was incidentally detected during surgery or obduction.

Diagnosis can be made only by x-ray demonstration of this organ through cholecystography. The number of diagnosed cases is exceedingly small. Golob and Kantor, reporting their two cases in 1942, considered them as the 7th and 8th, respectively, in the series of the roentgenologically demonstrated and diagnosed cases.

The relatively large series of our cases, and the fact that in all of them diagnosis was established by x-ray demonstration, may warrant the publication of these observations.

We are presenting here nine cases of double gallbladders diagnosed by their cholecystograms. The material was collected from our private cases. The period of observations covered the last 25 years.

### CASE REPORTS

*Case 1:*—F. T., a highly neurotic, married female of 59, exhibiting complaints of the most varied nature. Essential hypertension present for over ten years. Blood pressure readings: 250/135. Two attacks of coronary occlusion with myocardial infarction in recent years. *Atherosclerosis obliterans*. Huge solitary diverticulum at the duodenojejunal flexure. Double gallbladder, ostensibly of the bifid type. On most of the films, the two vesicles, lying in the same fossa, were superimposed on each other. On some of the films we succeeded in separating the two vesicles. On these films it looked more like a duplication of the gallbladder. The one chamber was somewhat smaller than the other. Both chambers elicited good function, as indicated by the dye concentration as well as the postprandial contraction. Only one cystic duct was visualized. There was a distinct reabsorption phenomenon. The gallbladder, in spite of the fact that it contracted promptly and fully, after a fatty meal, showed sharp visualization of both chambers, in full size and with good concentration, even on the 24, 48 and 72 hr. films.

No symptoms were attributable to either of these congenital abnormalities. There were occasional upper abdominal complaints such as pain, discomfort

and queer sensations. They were, however, not more frequent or severe than were her other complaints referring to normal parts of her body, such as the head, neck or lower abdomen, etc.

In this case, there were two rare congenital anomalies conjointly present and incidentally detected. Both the two congenital anomalies and the psychoneurosis were associated phenomena in a constitutionally inadequate individual. No abdominal exploration was made.



Fig. 1—Case 1. The two chambers are distinctly separated.

*Case 2:*—R. D., married woman of 67. Epigastric pain for 30 years, the cause of which never was diagnosed. When first seen in April, 1953, in our office, a series of changes were found, which might have been responsible for the chronic ailment. There was an egg-sized solitary diverticulum at the duodenojejunal junction, with a 5 to 6 hr. residue therein. The x-ray revealed a double gall-bladder of the bifid type. The two vesicles lay next to each other, superimposing their opaque contours. The dye concentration of the two chambers differed. On

some films the one chamber took up much dye, whereas the other showed poorer visualization. This distribution of the dye was not a constant feature. The post-cenal contraction was normal. Because of the presence of reabsorption, the gallbladder, in spite of full response to fatty meal, showed an unimpaired size and full visualization on the 24 and 48 hr. films. One cystic duct was visualized only. There was also a niche in the upper part of the minor curvature. Huge

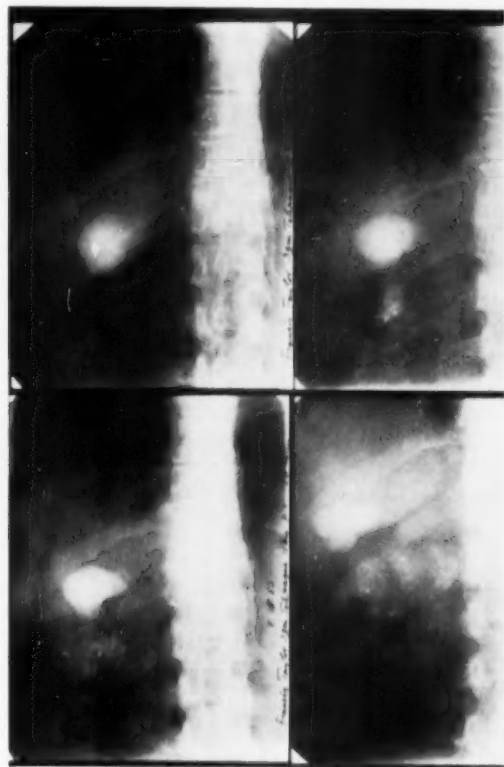


Fig. 2—The accessory vesicle is round and smaller and the true gallbladder is superimposed on it.

redundancy and ptosis of the colon, with the pattern of a double drooping of its transverse segment completed the list of the congenital anomalies.

The long standing epigastric pain was more probably due to the large diverticulum than to the double gallbladder. The former exhibited a 6 hr. retention, while the function of the gallbladder was perfectly normal. Anticholinergic medication (Banthine, Antrenyl) promptly stopped the annoying pain.

These first two cases were published in the Dec. 1953 issue of this journal.

*Case 3:*—A. F., white, married woman of 41. At rare occasions intermittent epigastric pain and discomfort for the last 5 years. A distorted duodenal cap with retraction, but without niche: a constant feature. In association there were the following congenital anomalies: malrotation of the duodenum and jejunum; colonic ptosis and redundancy; appendicular stasis; colonic diverticulosis; double gallbladder. The shape was indicative of a bilobed rather than of a ductular type. One cystic duct was visualized. Both chambers were sharply outlined in the shape of a figure 8, with their contacting central portions superimposed. Dye

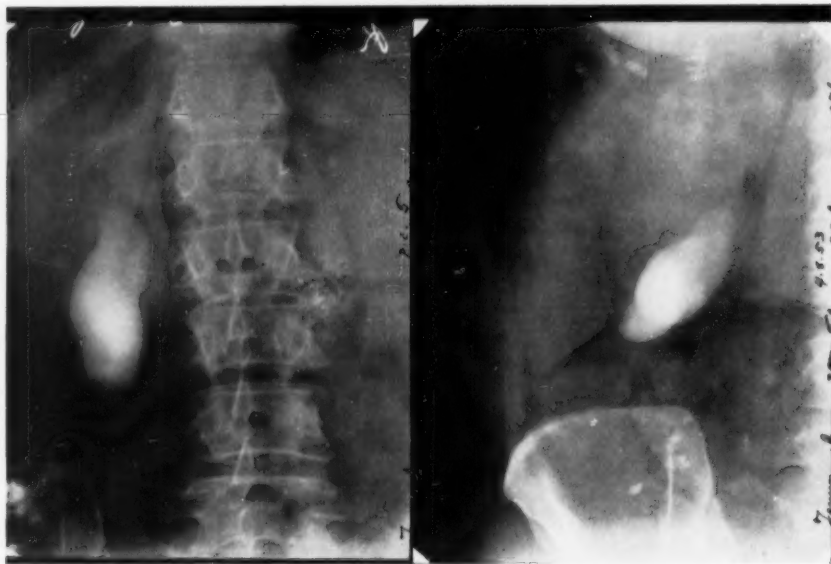


Fig. 3—Case 2. The double gallbladder appears in various shapes. The 2nd film represents a 72 hr. postprandial film.

concentration and postcena contraction were perfect, indicating good function. Here, the gallbladder anomaly in association with seven other, mostly congenital abnormalities, represented a constitutional inadequacy in an otherwise intelligent person in a highly responsible position.

*Case 4:*—F. J., white, woman of 40. Symptoms of intermittently recurring indigestion during the last three years. Two or three times every month incessant vomiting sets in and lasts 2 or 3 days. During these periods patient feels heavy, very weak, and extremely sick, although during the intervals she feels normal. No headaches. Since childhood she was prone to vomit frequently on the slightest provocation such as an unpleasant occurrence, or slight illness.

Roentgen examination of the gastrointestinal tract was largely negative. The gallbladder showed biloculation. The two gallbladders resembled the figure 8, with their two vesicles slightly superimposed at their junction. The same configuration persisted in an upright position. The dye concentration was good, the outline of the viscus was sharp. Its postprandial contraction was, however, poor. Due to this delayed emptying, the gallbladder, though reduced in size, was still visible 24 hrs. later. This was a delayed emptying rather than a reabsorption phenomenon.

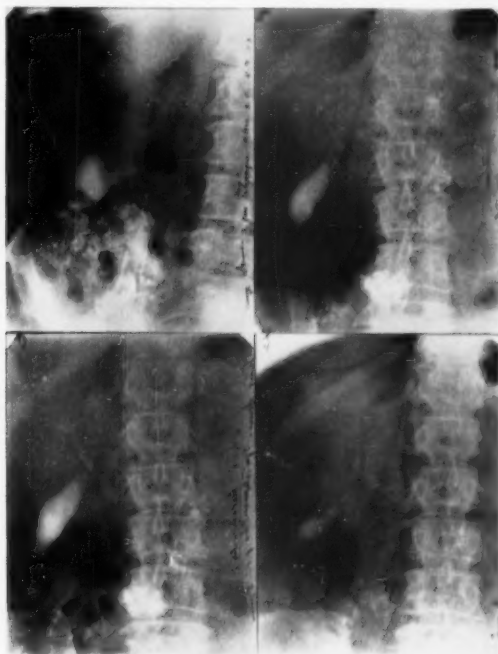


Fig. 4—Demonstrates the various stages of emptying. Note the unequal dye concentration in the two chambers.

In this case, with an otherwise healthy individual the features were periodic vomiting spells in association with a congenital double gallbladder. Whether the former symptoms resulted from the impaired motor function of the gallbladder, or rather developed as associated phenomena along with the congenital anomaly of the gallbladder in a constitutionally inferior individual, may be debatable.

*Case 5:*—M. E. S., white woman of 77. Symptoms of chronic indigestion. Sensitivity, occasional pain or discomfort in the epigastric region, culminating at very rare intervals in severe painful attacks. Chronic constipation. X-ray examination revealed normal stomach and duodenum, appendicular stasis and extensive



diverticulosis of the colon. The gallbladder is visualized as a double viscus, with one vesicle being larger than its accessory partner. Dye concentration was fairly good and equal in both chambers. Telepaque was used. Five minutes after the administration of a fatty meal *two cystic ducts* were visualized, a feature of a *ductular type* of a double gallbladder, a true *vesica duplex*. This seemed to be the case in spite of the fact that the two vesicles were not seen separately, but rather lay adjacently, and appeared to be superimposed. In the moment of visualization of the cystic ducts, the smaller vesicle, emptying its contents rapidly, contracted its size, in fact, nearly collapsed, whereas the visualization of the larger chamber was still fairly complete.

*Case 6:*—R. K., white, married, woman of 40. When first seen in 1941, she had been suffering for ten years. Ten years ago a double gallbladder was diagnosed



Fig. 5—Case 3.

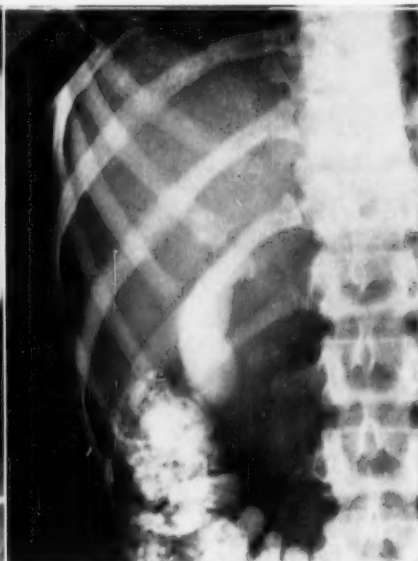


Fig. 6—Case 4.

by her physician in Hungary, who *failed to give her the necessary assurance* that her condition was not a serious one. Since that date she has suffered continuously, without a day's surcease. She was a psychoneurotic and developed a classic case of an *iatrogenic disorder*. She was bitter, disappointed and resentful, after having undergone three unnecessary operations (one for the removal of a normal appendix, and two sinus operations for headaches). Ceaseless and expensive treatments with diathermy, ultraviolet, electricity, vitamins, injections, psychoanalysis, etc., all of which proved valueless, tended to aggravate her condition. The symptoms were: epigastric and right upper abdominal pain; insomnia;

morning-tiredness; low backaches; sighing breathing; dizziness; headaches; intolerance to lightest foods; gaseous eructation; nausea and lack of libido. She was tired of living and anxious to die. The findings were: gastric anacidity; moderate 6 hr. gastric residue; otherwise negative gastrointestinal x-ray; normal skull and sinus x-ray; negative E.K.G. and exercise tolerance test. Strenuous exercise was well tolerated, but evoked a crying spell.

The gallbladder revealed a double contour. The two vesicles, about the same size and of normal dye concentration, lay in the same fossa, with their opaque shadows slightly overlapping. Although actually no symptoms were attributable to the double gallbladder, which apparently functioned normally, theoretically the entire list of complaints and sufferings *could* have been ascribed to this congenital anomaly. *Not the presence* of double gallbladder, but *the knowledge* of it

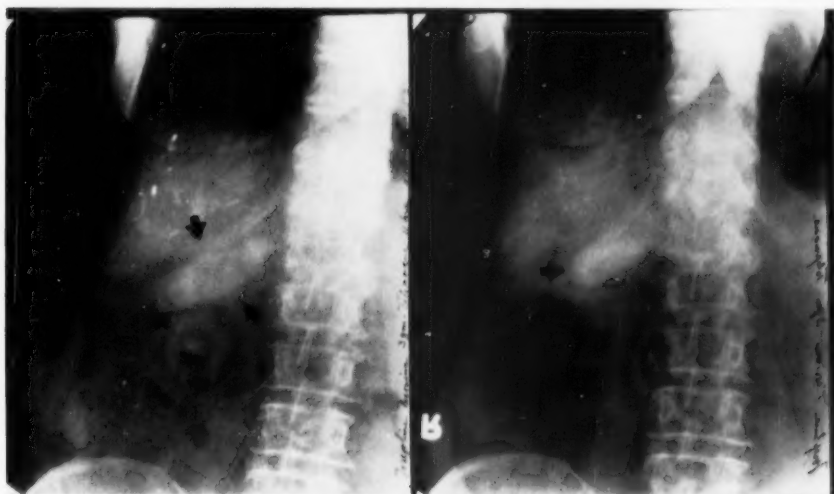


Fig. 7—Case 5. Two films are shown, visualizing the double gallbladder of a 77-year old female.

made her sick. The double gallbladder, like other congenital anomalies, is expressive of a constitutional inferiority, in the presence of which abnormal responses to environment and life situations could eventually be expected. Divulging the diagnosis of this anomaly without comforting the nervous patient served as a trigger mechanism. But at a given hereditary disposition, some other stress situation might have produced some other form of neurosis, at a later date.

**Case 7:**—T. O. M., white, married, woman of 50. Menopause. Signs and symptoms of chronic osteoarthritis affecting the spine, sacroiliac joints, hands and shoulders. Moderate art. hypertension (180/100 mm. Hg.); E.K.G. normal. Moderate sensitivity over the right upper quadrant in the abdomen. No history of any severe pain or cramps. She was not feeling nervous. She ended up in a state

mental hospital (as her sister did) because she was paranoid. X-ray revealed a three partitioned gallbladder. Two distinct gallbladders were diagnosed, one on top of the other, with a *diverticulum* at the lower edge of the lower vesicle. The dye concentration as well as the postcenaal contraction were good. On some of the postprandial films the three vesicles gave a picture of unusual appearance. A cork-screw shape seems to fittingly characterize the three segmented formation and the winding of the vesicles in a three dimensional space. S. Weiss'



Fig. 8—Five minutes after the fatty meal the smaller chamber is nearly emptied; its cystic duct is visualized by Telepaque. Both cystic ducts, the one with its convexity upward, the lower, with its convexity downward, are clearly and distinctly visible.

case was described as a cork-screw shape, Shanks and Kerley applied the term of trilobed gallbladder to their single observation.

*Case 8:*—D. E. P., white, married, obese woman of 37, first seen in 1942. She suffered from occasional upper abdominal pain and painful attacks. They were suggestive, though not typical of cholelithiasis. In the intervals she felt perfectly well. Weight reduction was a constant problem to her.

In 1942 the x-ray examination revealed a bilobed gallbladder. The two chambers were small and of equal size. The two vesicles formed the shape of a figure 8. The lower chamber contained a large stone, with a negative shadow. The dye concentration was poor and at several repeated examinations non-visualization was the result. The poor dye concentration, the frequent failure of visualization, the small size of the viscus, the presence of stone shadow and the repeated biliary colics were indicative of cholelithiasis, an acquired pathol-



Fig. 9—Case 6.

ogy on inflammatory or metabolic ground. The bilobed shape ostensibly represented a double gallbladder, although a diverticulum, the size of the gallbladder could not be ruled out. Their differentiation even at obduction may prove arbitrary. This case represented a combined occurrence of a congenital anomaly with the acquired pathology of cholelithiasis in one of the vesicles, while the other was free from pathology. Surgery was considered several times, though never carried out. Patient fared quite well without it.

*Case 9:*—V. I. G., white, married, woman of 28. Uneventful history with incidental finding of a bilobed gallbladder. The two vesicles met in a V shape. The median chamber looked somewhat smaller, but had a better dye concentration than the lateral, larger, true gallbladder. The accessory vesicle could have represented a huge diverticulum or a Phrygian cap. Their differentiation on purely radiological grounds remains problematic.



Fig. 10—Case 7. Double gallbladder with a diverticulum.

#### EMBRYOLOGY

Walters and Snell, after Lewis (1912) give a short description of the embryological development of the biliary system, explaining that failure or error in this developmental order will result in congenital anomaly of one sort or another.

As early as the fourth week a diverticulum arises in the ventral wall of the primitive foregut of a human embryo. The cranial portion is destined to differ-

entiate into the liver and the caudal portion into the gallbladder, both with their ducts. The zone of junction will elongate to form the future common duct.

In a 5 mm. embryo the originally hollow structures become obliterated due to massive cellular hyperplasia. For a time, the gallbladder and the future biliary ducts appear as solid masses and strands of cells. Thereafter individual clefts arise in the various structures. That produces the primitive lumina of the extrahepatic tracts. They coalesce to form the prospective gallbladder. If clefts fail to develop or fuse, obliterated lumen results in a congenital anomaly.

Gross describes embryologic small outpocketings which are frequently seen on the three ducts in early embryonic development. These rudimentary,



Fig. 11—Postanterior view and lateral view.

supernumerary buds normally regress, but the permanence of one of them may result in an accessory gallbladder. This is the ductular variety.

Hilt describes the formation of the bilobed viscus. According to him, the single bud becomes paired, but a primary connection is maintained, thus forming two separate and distinct fundi with one cystic duct.

S. Weiss (after Boyden) concisely summarizes, by stating, that a ductular type of gallbladder derives from the supernumerary vesicles, from either of the three ducts; bilobed gallbladder is formed by initial subdivision of the primitive gallbladder bud; the diverticular gallbladder results from persistence of cavities and septa in the primitive bud; the trabecular type represents a vesicular over-

growth of the liver trabeculae and may result in two widely separated gallbladders.

#### CLASSIFICATION

Cave (1931) originated the division of the double gallbladders into *vesica duplex*, or the ductular type, and *vesica divisa*, or bilobed variety. Boyden (1935) made the classification into the 4 groups as afore-enumerated.

Our main interest centers around Cave's grouping of the double gallbladders. The main differentiation between the ductular and bilobed types is decided by the number of cystic ducts present. In the ductular type there are two fully separated vesicles, each supplied by its own cystic duct. The two ducts enter the choledochus separately. In its subdivision, called the inverted "Y"-shaped double gallbladder, the duplication of the viscus is also complete, but the two separate cystic ducts merge, before joining the hepatic to form the *ductus choles-*

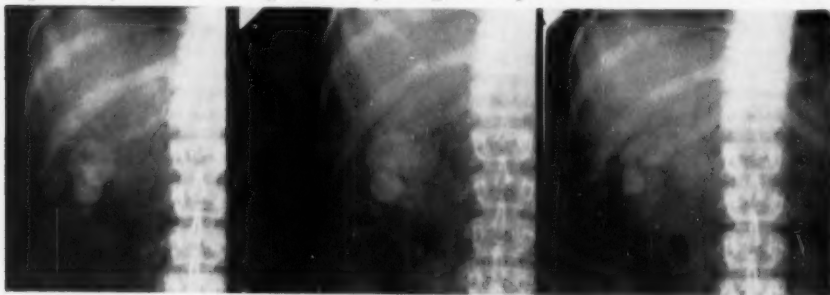


Fig. 12—Various films at various times, last film, a postprandial cork-screw shape.

*dochus*. Bockus considers the ductular type three times more common than the "Y"-shaped variety.

In the bilobed gallbladder (*vesica fellea divisa*) this viscus is separated at its fundic part by a deep septum, but the common, proximal portion of the vesicles are drained by one cystic duct. The separation leaves a cleft which may be of any depth. The external appearance to the surgeon or pathologist, though not to the radiologist, is that of a single gallbladder. Not until it is opened up, can the true nature of this anomaly be recognized. The deep dividing septum consists of a fibrous tissue, which may harbor muscle elements and even glands, at its septal mucosa. In its subdivision, the inverted "V"-shaped double gallbladder, the fundic portions are situated apart, but their proximal portion, at the neck of the gallbladder, after converging, coalesce into a common neck, which is drained by one single cystic duct.

The true duplication of the gallbladder, with separate cystic ducts, is considered the more common of the two varieties. The bilobed type with one single cystic duct for both wings is, in the general consensus, an extremely rare variety.



## INCIDENCE

Comparative anatomy points to extreme variations in the development of the biliary tract in various animals (Shanks and Kerley). Horses and rats do not develop gallbladder at all, cows and mice do.

The developmental anomalies vary in different animals. The double gallbladder according to Boyden, who made his study on 10,000 animals, is very common in cats, pigs, calves and lambs. It is the most common in cats, with a ratio of 1:8; the incidence being in calves 1:28; in lambs 1:85; and in pigs 1:98.

As against this Daniel Sasmor, a U. S. Veterinary Inspector's experience (Bureau of Animal Industry) may be quoted, who encountered only two instances of double gallbladder in a cattle autopsy of 75,000 head.

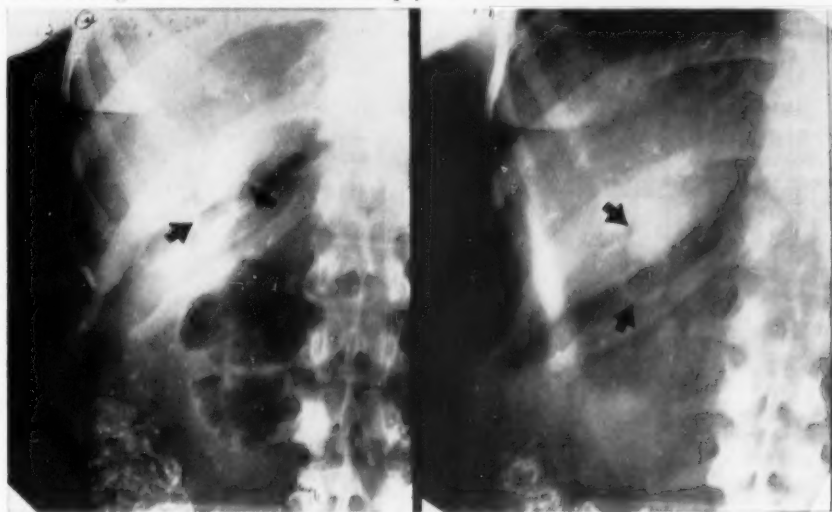


Fig. 13—Case 8.

In man, the double gallbladder is an extremely rare occurrence. Boyden collected 20 cases only, from the literature covering the period from 1674 to 1926. Seventeen of them represented true duplication of the viscus, and only 3 cases were of the bifid type. In Cruveilhier's collection only one double gallbladder was recorded until 1865; by 1931 two more cases were added. Boyden found no double gallbladder among his 9,000 cases. In a series of 19,000 cadaver cases and hospital patients 5 double gallbladders were found, an incidence of 1:4,000. Gross (1936) collected from the literature 148 cases of congenital anomalies of the gallbladder. That included 28 cases of double gallbladder, all of which represented true duplications, i.e. double vesicles, each with its own separate cystic duct. Only one was diagnosed by cholecystography. The second case, a bilobed gallbladder diagnosed by x-ray, is attributed to Hilt who reported

it in 1937. Golob and Kantor (1942) covering the literature of 1921-1941 found only 28 cases (13 U. S. and 15 abroad) of double gallbladder. Of this figure 20 were detected at operation or at autopsy. Out of this series only 6 were diagnosed by x-ray which, with their two added observations, totaled 8 cases of double gallbladder diagnosed by x-ray. Graham, et al found no double gallbladder in 1,218 cholecystographed cases. Climan in 1929 established the first x-ray diagnosis, the second, as mentioned, was that of Hilt, in 1937. Golob and



Fig. 14—Case 9.

Kantor's 2 cases brought up the series to 8, in 1942. In consideration of this scarcity of reports, our nine x-ray diagnosed cases represent a rather impressive enrichment of the total.

Bockus, Walters and Snell estimate that in at least 10 per cent of all cases developmental arrests occurred at some stage of the embryonic growth in the biliary system. This seems to be a rather conservative statement, inasmuch as the Phrygian cap alone represents an 18 per cent incidence of all presumptive

normal gallbladders, according to Boyden. Lockwood found some congenital biliary anomaly in 2.8 per cent of 1,464 cholecystographed cases. Out of this 51 per cent showed some pathology, suggesting that congenital anomalies may interfere with normal function and predispose to infection and stone formation (Shanks and Kerley). In the same vein, Gross states that most of these anomalies have been discovered at operations and relatively few came to obduction. Consequently these accessory structures are more likely to develop pathology than normal tissues.

#### DISCUSSION AND ANALYSIS OF OUR CASES

a) *Age, sex, characteristics*:—All our nine cases were females. Their age varied between 28 and 77 years. They were all severe neurotics, except one who was psychotic.

b) *Association with other congenital anomalies*:—Association with other congenital anomalies was frequent. The gastrointestinal tract offered the greatest variety for such anomalies. Usually more than one abnormality was present. Occasionally series of congenital anomalies were detected in one person. Shachner stated that in the presence of congenital anomalies in 18 per cent, more than one anomaly was found. In our series there was a much higher incidence of coexisting anomalies. Association with acquired or borderline pathology, such as colonic diverticulosis, appendicular stasis, etc., occurred unusually frequently. Cases 1, 2, 3, and 5 are instances of multiple congenital anomalies in association with double gallbladders. Most other cases were not subjected to painstaking thorough work-up and consequently one cannot say whether these cases had or did not have associated congenital anomalies.

c) *Symptomatology*:—The double gallbladder has no clinical symptomatology. In cases with impaired function, motor disturbances with delayed evacuation, symptoms may develop not dissimilar to those of a normal single viscus. Pathology: One or both vesicles may be affected. Their pathology in the 2 chambers may differ. In either case, the clinical symptoms will be similar to the pattern observed in a normally developed gallbladder. Cholelithiasis in one of the vesicles was noted in Case 8. Impaired function, delayed emptying and poor dye concentration were noted in Cases 4, 5, 8.

d) *Diagnosis*:—Diagnosis can be obtained only by x-ray demonstration of the anomaly. Corroborative evidence can be won by surgical finding or post-mortem examination.

For the differentiation between the two main varieties, visualization of the cystic duct is a prerequisite. Quite recently, since Telepaque (Winthrop-Stearns) was introduced into radiological practice, the immediate, postprandial visualization of the cystic duct, as well as of the other extrahepatic biliary ducts, became feasible. Previous technics, using other compounds were rarely successful in

visualizing the cystic duct. Failure of its visualization cannot diagnostically be evaluated either way\*.

e) *Differential diagnosis*:—In the presence of double gallbladder the primary purpose is to establish whether one or two cystic ducts are demonstrable. In the absence of visualization of the cystic duct and in case the two vesicles lie superimposed upon each other, the question of differentiation from a diverticulum or even a Phrygian cap may come up for consideration.

In the bilobed gallbladder there is a deep, longitudinal dividing septum which nearly, though not completely, bisects the viscus into two chambers of more or less equal size, communication being retained through the common cleft at the neck of the viscus.

In the diverticular gallbladder there is a communication between the two chambers through a narrow opening of the dividing membrane. This is located at the fundus or the free edges of the viscus. The cut-off diverticulum, generally solitary, is usually of small size. Size alone, however, is not a factor in the diagnosis of diverticulum, as there are cases on record, as in Gross' case, in which this outpouching surpasses the size of the original gallbladder. Its differentiation from a bilobed viscus is not always easy. Their differentiation, especially if pathology developed in a secondarily acquired congenital diverticulum such as stones or inflammation, may occasionally prove arbitrary. Even a postmortem study may leave this question unanswered.

Diverticulum of the gallbladder is rarely observed. At the Mayo Clinic it was found 25 times in a series of 29,710 operatively removed gallbladders. Curvoisier collected only 28 cases from the literature by 1890. Golob found in the literature 20 articles on diverticular gallbladder covering the period of 1921-1941.

The Phrygian cap, described by Bartel in 1916, and elaborated by Boyden in 1935, is characterized by a folding of the gallbladder, effected by a congenital band on the median side. The congenital band, which may produce a groove to a deep incisura, cuts through the viscus, usually transversely. Its differentiation from the bilobed gallbladder on ground of x-ray signs may encounter occasional difficulties. The Phrygian cap is the most frequent among all the congenital anomalies of the gallbladder. Transitions or not clear-cut cases must necessarily be encountered among these varieties of congenital malformations, and in our series some of the cases (3, 4, 8 and 9) may be scrutinized along these lines.

f) *Prevalence of the true duplication*:—Slaughter and Trout first pointed to the prevalence of true duplication of the gallbladder vs. bilobed form (1933). This is the general concept today. (Gross, Boyden, S. Weiss, Bockus, Feldman,

\*Since the date of submission of this paper for publication, the intravenous Cholografin (Squibb) has been advocated for the specific visualization of the extrahepatic biliary ducts with the promise of greater accuracy than hitherto possible.

Buckstein, Shanks and Kerley, etc.). In all 28 cases of Gross, separate cystic ducts were found. In Boyden's series the ratio was 17 to 3. In our series with the exception of Case 5, in which double cystic ducts were visualized, no classification was possible on ground of the x-ray evidence alone.

g) *Congenital anomalies as expressions of constitutional inadequacy:*—The double gallbladder, as congenital anomalies in general, may be indicative of a hereditary or constitutional inadequacy. In the presence of double gallbladder other congenital abnormalities may also be present, together with a hereditary disposition to develop neurosis or psychosomatic disorders at a later date.

Bartel in 1916 expressed a similar view. He considered Phrygian cap a developmental anomaly in association with other congenital disturbances, such as Meckel's diverticulum, herniations, retardation in the genital development, etc.

In our series, all the patients were constitutionally inadequate. Some had multiple congenital anomalies, whereas others acquired pathologies of varied nature. They were all neurotics, with the exception of one, who was psychotic.

In view of the association with neurosis, the symptomatology must be evaluated accordingly. Some of the complaints in case of double gallbladder are not due to this anomaly, but rather to the psychoneurosis concurrently present. This latter again, even in absence of any gallbladder anomaly, may present symptoms, similar or dissimilar in character.

h) *Medical vs. surgical treatment:*—The fact that the double gallbladder is *per se* asymptomatic, answers the question of its surgical indication. The double gallbladder requires surgery, as the normally developed single gallbladder does, i.e. only if associated pathology makes surgical intervention justified or imperative. In Case 8 the presence of cholelithiasis offered such indication. Patient refused it and fared well without surgery. There was no indication in any other case.

#### SUMMARY

Nine cases of double gallbladder were presented, diagnosed by x-ray demonstration of the viscus.

In the literature extremely few cases are on record and the number of their cholecystographic demonstration is even less.

Double gallbladder in our series was frequently associated with other congenital anomalies. Its discovery was incidental in each case.

There were no clinical signs or symptoms attributable to the presence of this anomaly.

## BIBLIOGRAPHY

- Assmann, Herbert: *Klinische Roentgendiagnostik der inneren Erkrankungen*, 3rd Ed., F. C. W. Vogel, Leipzig, 1924.
- Barsony, T. and Friedrich, D.: *Klin. Wehnschr.*, **7**:216, 1928.
- Bartel, J.: *Wien. klin. Wehnschr.*, **31**:605, 1918.
- Bockus, Henry L.: *Gastroenterology*, 3 Vol.; W. B. Saunders Co., Phila.-London, 1946.
- Boyden, E. A.: The "Phrygian cap" in cholecystography, *Am. J. Roentgenol.*, **33**:589, 1935.
- Buckstein, J.: *Clinical Roentgenology of the Alimentary Tract*, W. B. Saunders Co., Phila.-London, 1940.
- Carman, Russel, D.: *The Roentgen Diagnosis of Diseases of the Alimentary Canal*, 2nd Ed., W. B. Saunders, Phila.-London, 1921.
- Cave, P.: *Lancet* **1**:751, 1931.
- Climan, M.: *Med. J. & Rec.* **130**:73, 1929.
- Feldman, M.: *Clinical Roentgenology of the Digestive Tract*, 2nd Ed., The Williams & Wilkins Co., 1945.
- Galambos, A. and Galambos, W. M.: *Rev. Gastroenterol.*, **20**:867-882, 1953.
- Golob, Meyer: Diverticulosis of the gallbladder, *Am. J. Digest. Dis.* **10**:141, 1943.
- Golob, M. and Kantor, J. L.: Two cases of double gallbladder, *Am. J. Digest. Dis.*, **9**:120, 1942.
- Gross, R. E.: Congenital anomalies of the gallbladder, *Arch Surg.*, **32**:131, 1936.
- Hilt, L. M.: Bilobed gallbladder, *Radiology*, **28**:233, 1937.
- Lockwood, B. C.: *J.A.M.A.*, **136**:678, 1948.
- Markovics, E.: *Visceral Radiology*, The MacMillan, Co., New York, 1951.
- Pertl, A. L.: Diverticulosis of the gallbladder, *Ann. Surgery*, **98**:318, 1933.
- Portis, S. A.: *Diseases of the Digestive System*, 3rd Ed., Lea & Febiger, Phila., 1953.
- Shanks, S. C. and Kerley, P.: *A Textbook of X-ray Diagnosis by British Authors*, 2nd Ed., W. B. Saunders Co., Phila.-London, 1952.
- Slaughter F. G. and Trout, H. H.: *Am. J. Surg.*, **19**:124, 1933.
- Walters, W. and Snell, A. M.: *Diseases of the Gallbladder and Bileducts*, W. B. Saunders Co., Phila., 1940.
- Weiss, Samuel: *Diseases of the Liver and Gallbladder, Bileducts and Pancreas*, P. B. Hoeber, New York, 1935.

## NEW METHOD FOR THE DETERMINATION OF THE SIZE OF THE LIVER AND SPLEEN

WILLIAM NIMEH, M.D., F.A.C.P.

Beirut, Lebanon

### LIVER

*Hepatology and hepatometry:*—The liver, which is the largest organ in the human body is supported by pseudo-ligaments which would be insufficient to keep in place a viscera of such a magnitude, were it not for the intraabdominal pressure that holds it back constantly against the diaphragm, as well as, the molecular adhesion existing between the diaphragm and the convexity of the liver<sup>1</sup> (Fig. 1).

The liver occupies, topographically, the right hypochondrium, the epigastric region and a minimal part of the left hypochondrium, reaching at times the left midclavicular line. As we know, it extends from the 4th to the 11th rib and is composed of five lobes divided by the corresponding fissures, the right being the largest.

The average weight of the organ corresponds to 1/36 of the total weight of the body, about 2½ kg. more or less, and contains about 900 c.c. of blood. This average is in proportion less in the female and more in the fetus. The intestines play the role of a soft cushion of feathers upon which it rests comfortably<sup>2</sup>.

The principle diameters of the liver vary and calculations of authors differ ostensibly. According to the Anglo-American<sup>3</sup>, French<sup>12,13</sup>, and German<sup>11</sup> official school text books they are as follows (Fig. 2):—

	Gray	Testut	Rauber Kopsch
	cm.	cm.	cm.
Vertical diameter or thickness.	15-18	5-12	12
Longitudinal diameter or transverse.	20-22	20-40	17-18
Broad diameter or width.	10-12	15-27	18
or an average of:—			
V.D. (Vertical Diameter)	16.5	8.5	12
L.D. (Longitudinal Diameter)	21	30	17
B.D. (Broad Diameter)	11	21	18
			22.66 or 23 cm.
			18 cm.

In order to determine the size of the liver, it is necessary to verify it by repeated examinations and not be misled by hepatic dullness on percussion, as it is usually done, nor by topographic relations to ribs, vertebrae, etc., because these differ with the posture of the patient and the changes of the adjacent organs. *Normal liver is not palpable while the patient is in a recumbent position, but it is slightly so while sitting up or standing.*



How many times we erroneously diagnose an hepatomegaly for the simple reason that the inferior border of the liver is palpable and so many finger breadths below the costal arch!

The two methods of exploration, palpation and percussion, should be used simultaneously always taking into consideration the possibility of the change of position of the organ even in normal conditions. Palpation, which should be performed with smoothness, furnishes fundamental clinical data particularly of the anterior border of the liver.

We should always remember that there exist basculation, rotation, deformation and anomalies of the liver, and that the position of the patient examined, whether in bipedistation, or in decubitus (supine, ventral or lateral), as well as

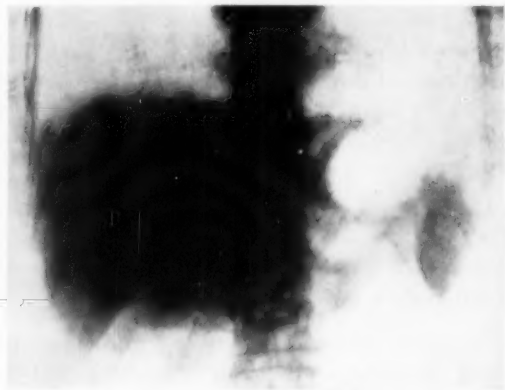


Fig. 1—Hepatography and Splenography with Thorotrast (First taken in Mexico, Nimch and F. Hernandez).

his configuration (dolichomorphic, brachymorphic) and his complexion (thin, corpulent), greatly influence the hepatic topography<sup>4</sup>.

Moreover, we should take into account the possible modifications of the neighboring organs which can easily exercise compression leading thus to change in the size, position and form of the liver; or adhesions that might form between them and give rise to contraction which changes both site and position. Finally, among the factors which may change the position of the organ we must mention the respiratory movements, especially inspiration, during which the liver may lightly pass the costal border and be mistaken for a moderate enlargement<sup>15</sup>.

It is interesting to note that the pressure caused by the indumentary, such as the corset used in old times and even nowadays, affects the form of the thorax as well as the topographic position of the liver and even its morphologic characteristics.

We should also remember that *infiltration and cirrhosis of the liver due to any cause, increase its volume as a whole*. Circumscribed tumors, cysts and abscesses partially alter liver size<sup>5,7</sup>.

Hepatomegaly may exist without abnormal function tests denoting damage<sup>2</sup>. The picture of three very recent cases of cancer of the liver are still vivid in my mind: a woman of 35 with metastatic cancer of the liver secondary to cancer of the large curvature of the stomach, and two women of 63 and 75 respectively, with primary cancer of the liver. The chief symptom in the three patients was abdominal pain, almost constant, but varying in intensity, indigestion and frequent vomiting after food intake. The duration of the illness was between 5 and 6 months. The first case ended in ascites, the third in icterus and the three patients succumbed to progressive emaciation. Laparotomy confirmed the diag-

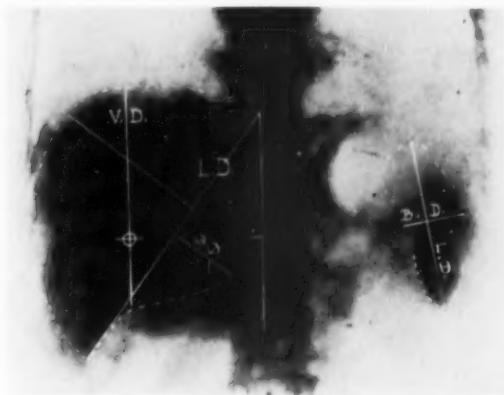


Fig. 2—The diameters of the liver and spleen.

nosis in the first case and needle biopsy in the second. Liver function tests and blood chemistry in the three patients failed to reveal any liver function disorder.

Daily clinical experience that calls for the determination of the size of the liver leads us to the following conclusions:

1. The boundaries of the liver stipulated by the rules of physical examination are not static and prone to variation.
2. The costal margin considered as landmark should be abandoned because it is not absolute.
3. Palpation and percussion, being practical and relatively easy to perform, are not all in all exempt from errors and cannot give the exact and precise size of liver.

Normally the liver should not be palpable; in children, however, it is normally palpable. We learned and taught that palpable liver indicates enlargement. Yet not every palpable liver is enlarged.

Percussion is not always precise because it does not denote the parts of the liver which are covered by the lung and the intestines full of gas and fecal matter. It gives us absolute dullness only.

4. That a standardized measurement of the liver should be adopted.

We have been for years satisfactorily employing a method for the determination of the size of the liver that we believe to be simple and practical. It is based on eliciting the vertical diameter, which is the index of liver size, by percussion and determination of its measurement<sup>9,10</sup>. After many trials we decided to replace or combine the method of percussion with roentgenography by which



Fig. 3—Clinical method for determining vertical diameter of the liver.

we can approach as much as possible a more approximate and exact determination. We confess though that both methods are far from being perfect or from revealing the precise and definite size of the liver. We hope, however, that this preliminary communication will call the attention of and stimulate others to find a better and more accurate method.

#### CLINICAL METHOD

On percussing the hepatic region to determine the area of dullness we mark the vertical diameter along the right midclavicular line; then we place the tip of the thumb on the superior boundary of the determined zone of dullness, and the tip of the extended index finger down as far as it reaches following always the direction of the midclavicular line. The thumb and the index finger in the shape of a compass, form a right angle whose hypotenuse, formed by the

midclavicular line indicates a length of approximately 13 cm., or about seven finger breadths. *This measure corresponds arbitrarily to the average length of the hypotenuses of the different examiners.* If the area of dullness extends beyond the tip of the index finger, that is to say if it exceeds 12-13 cm., it means that the volume of the liver is more than its normal size (Fig. 3).

#### RADIOLOGIC METHOD

Finding that palpation and percussion often fail to demonstrate the correct size even though made by the most experienced clinician, we turned to radiology for help. This should often be resorted to as a guide in physical examination<sup>14</sup>.

We have been studying the application of radiology to solve this problem and after many trials we believe we have arrived at a satisfactory result with the technical help of K. Greinder. The method is the following:

The patient, while fasting, and after a cleansing enema, is put on a Bucky table in supine decubitus. At a focal-film distance of one meter, and allowing the central ray to fall on a point halfway between the median line of the body and the contour of the external right side of the body at the level of the costal arch and on deep inspiration, a flat film of the hepatic region is taken. The diameters of the liver are then traced according to a standardized method.

Three diameters of the liver are defined:

1. *The Vertical Diameter:*—The most important, the index of hepatomegaly, corresponds to the distance measured between the highest point of the liver through the focus and the lower border.

2. *The Longitudinal Diameter:*—As it is not possible to outline clearly the upper border of the left lobe of the liver, an auxiliary point has to be established. A horizontal line is drawn from the point where the right diaphragm joins the right border of the vertebral column to the median line. Then, from the latter point a line is drawn down to the tip of the right lobe.

3. *The Broad Diameter:*—This is measured by the largest distance from the right diaphragm to the left border of the liver taken in a perpendicular direction to the longitudinal diameter.

As the hepatogram is taken at one meter focal distance, measurements on film do not correspond to real figures, but are augmented; therefore, they have to be reduced. This reduction should be in the proportion of the transverse diameter drawn from the median line to the outer contour (skin) of the body measured on the film to the same diameter measured on the body.

Calculation is made thus:—

T.D. (Transverse diameter on film from median line to skin) to the (diameter required of liver on film) as T.D. (transverse diameter on body from median line to skin) is to x

Or,

$$\frac{\text{T.D. on body} \times \text{required diameter on film}}{\text{T.D. on film}} = \text{Real measurement of required diameter.}$$

In our figure No. 4, the vertical diameter of the liver on film is 20.2 cm., but it should be 17.5 cm.

Thus:—

$$15 : 20.2 :: 13 : x \text{ or } \frac{13 \times 20.2}{15} = 17.5 \text{ which indicates the real vertical diameter of the liver of the case in question.}$$

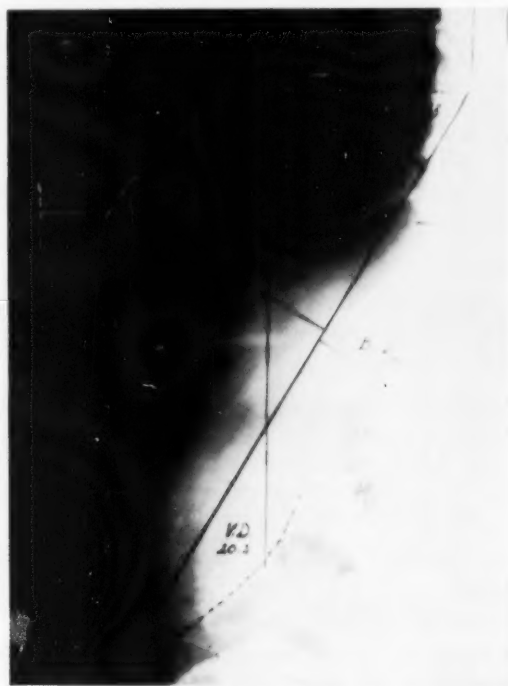


Fig. 4—Hepatography and hepatometry.

#### SPLEEN

*Splenography and splenometry:*—The spleen is the largest ductless gland in the body, weighs about 200 gm. and stores 20 per cent of blood volume<sup>3</sup>. The size and weight of the spleen are liable to extreme variation: increases in size during and after digestion and it attains its maximum volume in adults. It is

subject to rhythmical contractions (one per minute). The viscera is reduced during a contraction to 18 per cent in volume<sup>6</sup>. It is found in the posterior portion of the left hypochondrium extending to the epigastrium and the diaphragm and occupying the space between the 9-11 ribs, its long axis following obliquely the 10th rib, its superior pole is only a few cm. away from the vertebral column and covered by the lung. The spleen follows the respiratory and gastric movements<sup>6</sup>.

Percussion of the spleen is difficult and more so than the liver. Only the absolute dullness is taken into account because it reveals the size of the two



Fig. 5—Spenography and Splenometry.

anteroinferior thirds of the organ; its superior third being covered by the lung. To percuss the spleen, which should be performed very lightly, both methods, palpation and percussion, should be used. Palpation is made while the patient is in the right lateral decubitus and the examiner standing either to the right or the left side of the patient. The fingers of one or the other hand respectively are inserted below the costal border. We must remember that not every tumefaction we feel has to be taken for the spleen; we must prove the finding. Also, remember that respiration influences the topography of the spleen displacing it outwards

and inwards. Percussion is performed on the patient, while still being in the same decubitus position, with lightness because our object is to identify the absolute and superficial dullness. Percussion should begin from the posterior axillary line to where dullness begins which usually is between the 8th and 9th ribs. Dullness should continue downwards in a perpendicular line to the costal arch which covers habitually an extension of 5-7 cm. If in this way dullness exceeds the aforesaid number of cm., it is then considered as enlarged<sup>4</sup>.

Finally *the spleen is not palpable normally* and when it is so, its enlargement represents, according to some clinicians, one-third more than its normal size<sup>4</sup>. Eppinger states that in some cases a large spleen may be the only symptom of a latent cirrhosis.

Thus, we see that in determining the spleen size, roentgenology is more necessary than in the case of the liver. We will always remember the ordeal of being examined by a group of distinguished specialists in a famous American clinic where efforts were made to determine and agree among themselves whether or not our spleen was palpable.

Splenography and splenometry are conducted on the same basis as for the liver and the measurement of the broad diameter, which is the index of splenomegaly and whose average is 7.5 cm., should be considered as index of average normal size.

The diameters of the spleen are the broad, the longitudinal and the thickness. The first two are concerned in our calculation.

According to Anglo-American, French and German official text books they are:—

	Gray	Testut	Braus	Average
B.D. (Broad Diameter)	7.5	8	7 cm.	7.5 cm.
L.D. (Longitudinal Diameter)	12	13	12 cm.	12 cm.
Thickness	3	3-3.5	4 cm.	3.5 cm.

1. *The Broad Diameter*:—The index of splenomegaly, defines the largest distance between the upper (outer) and the lower (inner) border of the spleen and measures about 7.5 cm.

2. *The Longitudinal Diameter*:—This is taken in the perpendicular direction to the broad diameter joining the two most distant points of the organ shadow and measures 12 cm.

The method of the diameter tracing is as follows:—

A flat film, at one meter focal-film distance on a Bucky table is taken, the patient fasting and in supine decubitus, centered at a point halfway between



the median line and the outer contour of the body at the level of the left costal arch. The left transverse diameter may differ from the right due to asymmetry. On such a film the proper shadow of the spleen can be in general outlined although sometimes only faintly.

Calculation of the diameters is made in the same way as for the liver.

In Figure 5, which shows the shadow of the spleen of the same patient the Broad Diameter on the film is 7.9 cm., but in reality it should be 6.85 or 7 cm.

Thus:—

$$15 : 7.9 :: 13 : x \text{ or, } \frac{7.9 \times 13}{15} = 6.85 \text{ or } 7 \text{ cm. which indicates the Broad Diameter of the spleen of the case in question.}$$

An experienced technical radiologist, in collaboration with a competent clinician, is always necessary.

We believe that a further step should be taken, namely, the establishment of normograms, as is done with the heart, for the evaluation of liver and spleen size and the calculation of the diameter indices of hepatomegaly and splenomegaly.

The changes in size of the liver and spleen which we have already discussed in detail should, by no means, be a stumbling block. The same controversial difficulties are encountered with the heart. The size of the heart varies greatly from systole to diastole. Extremes of respiration and imperfect technic also affect heart size. Even if these were eliminated there will always exist a 5 per cent enlargement of the heart shadow (Roentgenology of the Heart).

Moreover, a less expensive, safer and more adequate contrast for portraying a good shadow of the liver and spleen than thorotrast should be found for current use.

#### SUMMARY

The difficulty of determining the exact liver and spleen size and the importance of finding a method, as approximate as possible, for the accurate measurement figures, are discussed.

A new method is suggested: (a) clinical, by percussion, to define the vertical diameter of the liver, index of hepatomegaly, and (b) radiologic, by hepatography, hepatometry and splenography and splenometry to measure the diameters of the liver and the spleen.

The vertical diameter of the liver is the index of hepatomegaly and measures 13 cm.

The broad diameter of the spleen is the index of splenomegaly and measures 7.5 cm.

Attention is called to the need of normograms and of a new contrast.

#### REFERENCES

1. Best, C. R. and Taylor, N. B.: *The Physiological Basis of Medical Practice*, 1940.
2. Bockus, H.: *Gastroenterology*, 1946.
3. Dameshek, W. and Estren, S.: *The Spleen and Hypersplenism*, 1947.
4. Eppinger, E. and Watzel, P.: *Las Enfermedades del Hígado*, 1930.
5. Goodman, J. I.: Hepatomegaly and Diabetes Mellitus. *Ann. Int. Med.*, (Nov.) 1941.
6. Gray, H.: *Anatomy Descriptive and Applied*, 1913.
7. Kehr, H.: *Spezielle Pathologie und Therapie Innerer Krankheiten*, Viena, 1923.
8. Lauda, E.: Chronic Cholangitis. *Encyclopedia of Medicine*.
9. Nimeh, W.: Chronic Cholangitis. *Rev. Gastroenterol.*, 1945.
10. Nimeh, W.: *Gastroenterología en México*, (Payet, Mexico), 1946.
11. Rauber—Fr. Kopsch: *Lehrbuch der Anatomie*, IX Edit., 1911.
12. Testut, L.: *Traité d'Anatomie Descriptive*, 1944.
13. Testut, L.: *Traité d'Anatomie Topographique*, 1944.
14. Waring, J. J.: The Physical Examination: Helps and Hindrances. *Ann. Int. Med.*, (Jan.), 1948.
15. Weiss, Samuel: *Diseases of the Liver, Gallbladder, Bile Ducts and Pancreas*. Paul B. Hoeber, Inc., New York, 1935.

# CLINICAL TRIAL OF ERYTHROMYCIN IN AMEBIC LIVER ABSCESS\*†

VIKIT VIRANUVATTI, M.D.

and

PRACHA BISESHURARIT, M.D.

Bangkok, Thailand

McQuire et al (1952) have reported a new antibiotic, erythromycin (Ilotycin), isolated from a strain of *Streptomyces erythreus*. Preliminary studies with the drug, erythromycin, indicated the antibiotic to be of low toxicity and to be active against *E. histolytica* (McCowen et al, 1953). In our experience with intestinal amebiasis, erythromycin has shown promising results (Viranuvatti and Bisheshurarit). Heilman, Herrell, Wellman and Geraci (1953) stated in their studies that erythromycin is concentrated in the liver and excreted in the bile in the biological active form. With this knowledge we have tried erythromycin in two cases of amebic liver abscess.

## MATERIALS AND METHODS

Owing to limited supply of the drug, only two cases of amebic liver abscess have been on clinical trial. Both cases were admitted to a medical ward and kept under close observation with follow-up as long as possible. The diagnosis was based on the finding of anchovy-sauce pus aspirated from the liver. In both cases the abscess cavities were small and the general condition of the patient was fairly good. Daily blood count, blood pressure readings, symptoms and signs of toxicity were closely observed. Erythromycin was given in the dosage of 500 mg. every six hours for ten consecutive days totaling 20 gm. in each case.

## CASE REPORTS

*Case 1:*—Mr. K. T., H. N. 75162-96, a 42-year old business man was admitted on 19 Aug. 1953, with the complaint of mild, dull localized pain in the right upper quadrant of abdomen, aggravated by sneezing and coughing. The pain gradually increased in severity day by day for two weeks prior to admission. Nine days after the onset, fever and chilly sensation developed, the latter disappeared after three days. One day before admission the pain became more severe. Bowel movement was normal.

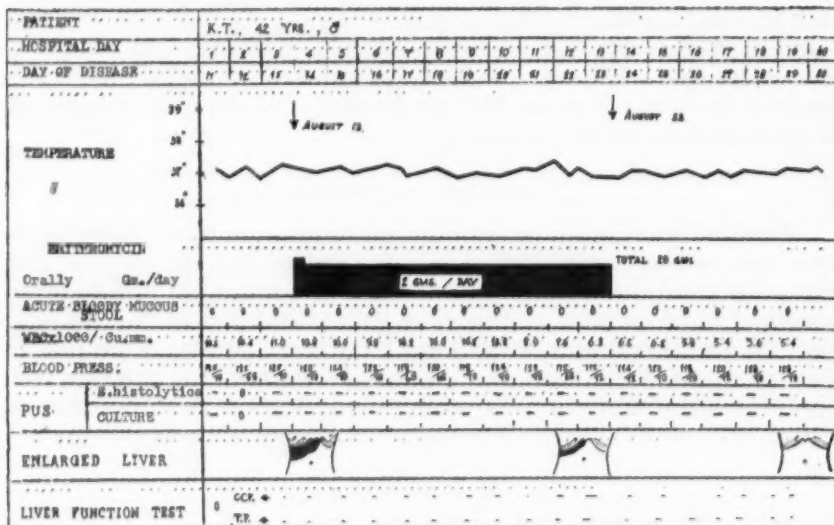
The physical examination on admission revealed a nonicteric, moderately toxic, well-built man. Temp., 37.2 C.; P., 80/min.; B. P., 120/60 mm. Hg. The

\*From the Department of Medicine, Siriraj Hospital, University of Medical Science, Bangkok, Thailand.

†The erythromycin used in this study was kindly supplied to us by the Department of Research, Eli Lilly and Company, Indianapolis, Indiana, through the courtesy of the British Dispensary, Bangkok, Thailand.

liver was soft, tender and enlarged about two fingerbreadths under right costal margin. No bulging or tenderness was noticed. Examination of the respiratory system revealed diminished movement of the right lower chest.

Laboratory studies showed Hgb., 14.0 gm.; R.B.C., 5.3 ml.; W.B.C., 10,500, with 85 per cent polymorph.; 10 per cent lymph.; 3 per cent mono.; icterus index, 7.0; blood cholesterol, 177.8 mg. per cent; serum albumin, 3.4 gm.; serum globulin, 2.2 gm.; alkaline phosphatase, 9.97 Bodansky units; cephalin-cholesterol flocculation test, 2+; thymol flocculation test, 2+; and the Kahn test was 4+. X-rays of the chest and right dome of diaphragm showed upward enlargement of left lobe of liver, possibly from liver abscess. Liver aspiration was done on the first



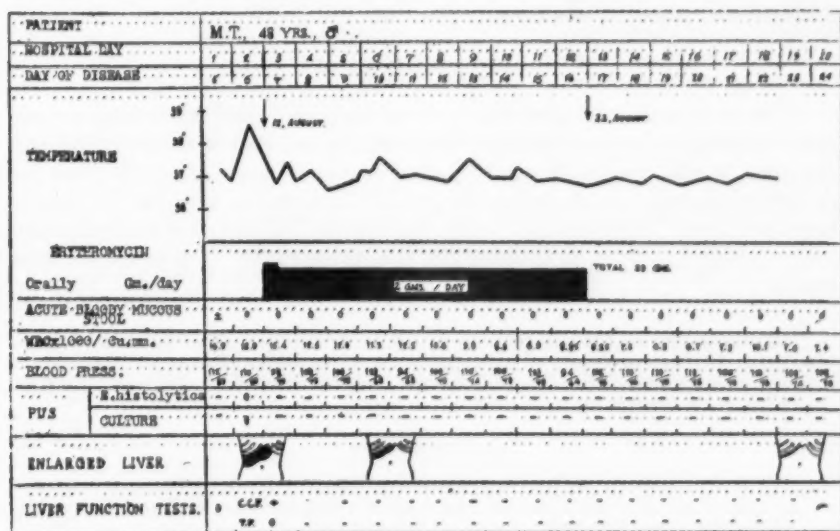
Case 1.

day of admission from which 60 c.c. of anchovy-sauce pus was obtained. Microscopically the fluid contained numerous R.B.C., necrotic cells, microorganisms; parasites were not seen.

Ilotycin was given on 12 Aug. 1953, in the dosage as scheduled (See chart of case 1). The patient complained of nausea and abdominal discomfort on the third and fourth day of administration which was transient and, later, relieved without drug withdrawal or additional symptomatic treatment. Definite improvement in the patient's general condition including disappearance of pain and tenderness occurred within the fourth day of administration. Erythromycin was withdrawn on 22 Aug. 1953. The patient remained symptom-free until discharge 14 days after cessation of Erythromycin therapy. On the day of discharge the

liver was one f.b. below the right costal margin and not tender. After discharge the patient continued to attend the out-patient clinic for follow-up and has been asymptomatic. The liver is not palpable up to this date (110 days after drug withdrawal).

**Case 2:**—Mr. M. T., H. N. 35371-96, a 48-year old farmer was admitted with the complaint of pain in the right costal margin for four days prior to admission. The onset developed ten days before admission beginning with vague epigastric distress like something stuck in the abdomen. This was followed by the appearance of a moderately tender mass under the right costal margin three days later. Moreover, dull-aching pain, gradually increasing in severity, developed in the right hypochondrium, so he was brought for admission.



Case 2.

Physical examination revealed a rather thin and moderately toxic patient. Temp., 37.5 C.; P., 95/min.; B. P., 130/80 mm. Hg. There was slight bulging of the right lower chest and the epigastrium. The liver was smooth, tender and enlarged three fingerbreadths below the right costal margin in M.C.L. Other findings were noncontributory.

Laboratory studies showed Hgb., 8.7 gm.; R.B.C., 3.69 ml.; W.B.C., 16,950; with 63 per cent polymorph.; 31 per cent lymph.; 4 per cent mono.; icterus index, 7.0; blood cholesterol 82.5 mg. per cent; serum albumin 3.8 gm.; serum globulin 2.0 gm.; blood sugar 105 mg. per cent; cephalin-cholesterol flocculation test 1+; thymol flocculation test neg.; urine and stool examination were negative. X-ray

of the chest showed elevated right dome of diaphragm with limited excursion and minimal infiltrations of the right upper lobe. On the second day of hospitalization, liver aspiration was performed yielding 30 c.c. of anchovy-sauce pus. Microscopical examination showed numerous R.B.C. and necrotic cells. *E. histolytica* was not found in the pus (usually so). Erythromycin was administered on 12 Aug. 1953. Three days after drug administration pain and tenderness markedly decreased with feeling of sense of well-being. The patient could tolerate the drug well. On 16 Aug., the liver was one fingerbreadth below the right costal margin. Erythromycin was discontinued on 22 Aug. 1953, and by this time the patient was asymptomatic. The patient was discharged on 1 Sept. 1953. On discharge, the liver was barely palpable and not tender. The patient has resumed his normal activities since discharge from the hospital without any discomfort, and reports weekly for follow-up.

#### CONCLUSIONS

The two cases treated in this trial are early and mild, each with a small cavity needing only one aspiration. Only mild toxic effect of erythromycin was observed in one case—mild nausea and abdominal discomfort. Both cases are definitely clinically cured. Follow-up (of 110 days in one case and 90 days in the other) gives "symptom-free" result. Further clinical trial on a more extensive scale is needed in order to evaluate the final value of this drug in amebic liver abscess.

*Acknowledgment:*—The authors wish to extend their sincere appreciation to Dr. Pyn Maungman, the Dean of Faculty of Medicine, University of Medical Science for permission to publish this report, and Prof. Prasert Kangsadal, Head of Medical Dept., for valuable suggestions while going through the manuscript.

#### BIBLIOGRAPHY

- Heilman, R. F., Herrell, W. E., Wellman, W. E. and Geraci, J. E.: Some laboratory and clinical observation on a new antibiotic, Erythromycin (Ilotycin), Proc. Staff Meet. Mayo Clin. **27**:285-304 (June 16), 1952.
- McCowen, Max C., Callender, M. E., Lawlis, F. J. and Brandt, M. C.: The effects of Erythromycin (Ilotycin) against certain parasitic organisms, Am. J. Trop. Med. & Hyg. **2**:212-217, 1953.
- McGuire, J. M., Bunch, R. L., Anderson, R. C., Boaz, H. E., Flynn, E. H., Powell, H. M. and Smith, J. W.: Ilotycin, A new antibiotic, Antibiotics and Chemotherapy, **2**:281 (June), 1952.
- Viranuvatti, V. and Biseshurarit, P.: Clinical trial of Erythromycin (Ilotycin) in intestinal amebiasis. (To be published).

### *President's Message*

Our regional meetings afford the opportunity for a few days away from the office, participating in a healthy exchange of thought and ideas. All of this is good for us as individuals, and for our College in particular.

Now is the time to think seriously about attending our mid-year meeting in Memphis. It is to be held at the Hotel Peabody, on Sunday afternoon, 24 April. The Trustees will hold their meeting in the morning, for the transaction of the business of the College.

Dr. John E. Cox is in charge, and has arranged a very impressive program. Dr. O. W. Hyman, Dean of the Medical School, University of Tennessee, will give the opening address.

Among the other speakers will be: Dr. L. C. Sanders, Memphis; Dr. N. Edward Rossett, Memphis; Dr. E. Leonard Posey, Jackson, Miss.; Dr. John M. McMahon, Bessemer, Ala. and Dr. James T. Nix, New Orleans, La. There will also be a speaker from Texas obtained through Dr. Heinz Eisenstadt.

All interested physicians are invited to attend. Strangely enough, last year's regional meeting in Milwaukee, proved the fact that busy doctors like "more of the same",—a medical meeting on a Sunday afternoon.

Let's develop a slogan for April 24th, "Spend a Sunday in Memphis". This is another assignment for the Governors in the area.

On the Annual Convention and Postgraduate Course, Drs. Kirchner and Wirts report excellent progress with the programs for Chicago, in the Fall. Again, the Governors have been most helpful, attesting to the fact that key men in regional areas can, and must, mold the thought and initiate the policies that should spell success for our College.

See you in Memphis.





## NEWS NOTES

### COLLEGE REGIONAL MEETING

A regional meeting of the American College of Gastroenterology will be held in Memphis, Tenn. The one day session will take place at the Hotel Peabody on Sunday afternoon, 24 April 1955.

The program for the session is being arranged by Dr. John E. Cox, assisted by the governor of the College for Tennessee, Dr. E. G. Campbell.

This will mark the second regional meeting since the regions were defined and it is anticipated that the attendance will be as good as at the first meeting in Milwaukee, Wisc., in March of 1954.

Members of the medical profession are cordially invited to attend the session.

---

### ANNUAL CONVENTION—INTERNATIONAL ACADEMY OF PROCTOLOGY

The 7th Annual Convention of the International Academy of Proctology will be held at The Plaza Hotel, New York City, 23 to 26 March 1955. The International, National, and Local Program Committees are planning an unusual seminar on anorectal and colon surgery. There will be special emphasis on anorectal presentations, and on panel discussions, as requested by those who attended the Chicago meeting in 1954.

Plans are being developed for wet clinics and lectures at the Jersey City Medical Center under the direction of Dr. Earl Halligan, surgeon-in-chief of the Medical Center.

Eminent speakers from all parts of the country and abroad will present interesting papers and motion picture demonstrations of their personal technics. Mexico is expected to be very well represented at this meeting.

The Women's Auxiliary has planned a very unusual program for the wives of the members and their guests.

Please remember that all physicians and their wives are cordially invited to attend the annual conventions of the International Academy of Proctology, whether or not they are affiliated with the Academy. There is no fee for attendance at these teaching sessions of the Academy.

---

### SIXTH NATIONAL GASTROINTESTINAL CANCER CONFERENCE

The Sixth National Gastrointestinal Cancer Conference will be held in New York City on 4 and 5 April 1955. With the New York Cancer Society acting as

host, the conference will meet in Hosack Hall at the New York Academy of Medicine, 5th Avenue and 103rd Street.

The conference is sponsored by the Gastrointestinal Cancer Committee of the National Advisory Cancer Council, National Cancer Institute, and is a continuation of the committee's activities in stimulating the interest of investigators in and disseminating information about the gastrointestinal cancer problem. Clinical aspects of the problem will be emphasized in the program of the conference. All interested scientists are invited to attend.

#### DR. EDWARD D. CHURCHILL AWARDED YANDELL MEDAL

On 11 November 1954, the Louisville Surgical Society awarded the annual David W. Yandell Medal to Doctor Edward D. Churchill, Homans Professor of Surgery at Harvard Medical School, Boston.

The annual award and lectureship were instituted to honor the memory of David W. Yandell, founder of the society, who was Professor of Surgery in the University of Louisville School of Medicine from 1869-1898.

Dr. Churchill conducted several surgical conferences at the University of Louisville Hospitals and addressed the Faculty Research Seminar of the University on "Research in Surgery". The subject of the Yandell lecture as presented by Dr. Churchill was "The Healing of Wounds".

**SEDATION  
AND EUPHORIA FOR NERVOUS,  
IRRITABLE PATIENTS**

**Use**

**VALERIANETS-DISPERT**

Reg. U. S. Pat. Off.


Each Chocolate Coated Tablet Contains Est. Valerian (highly concentrated) 0.05 Gm. dispergenized finely subdivided for maximum efficiency

**TASTELESS, ODORLESS, NON-DEPRESSANT SEDATIVE and EUPHORIC**

VALERIANETS-DISPERT are indicated in cases of nervous excitement and exhaustion, anxiety and depressive states, cardiac and gastrointestinal neuroses, menopausal and menstrual molimina, insomnia.

Dose: 1 or 2 tablets t.i.d. — Bottle of 50 and of 100 tablets

At All Prescription Pharmacies



For Intestinal Dysfunction

**NUCARPON®**

Each tablet cont: Extract of Rhubarb, Senna, Precip. Sulfur, Peppermint Oil, Fennel Oil in activated charcoal base.

For making Burrow's Solution

U.S.P. XIV

**WET DRESSING Use**

**PRESTO-BORO®**

(Aluminum Sulfate and Calcium Acetate)

**POWDER IN ENVELOPES**

— TABLETS —

For treatment of Swellings, Inflammations, Sprains

For Pulmonary Conditions

**TRANSPULMIN®**

1% solution Quinine with 2% Camphor for Intramuscular Injection

STANDARD PHARMACEUTICAL CO., INC., 253 W. 26 St., N. Y. 1, N. Y.

## ABSTRACTS FOR GASTROENTEROLOGISTS

### ABSTRACT STAFF

JOSEPH R. VAN DYNE, *Chairman*

ABE ALPER  
ARNOLD L. BERGER  
A. J. BRENNER  
J. EDWARD BROWN  
JOHN E. COX  
IRVIN DEUTSCH

LEROY B. DUGGAN  
KERMIT DWORK  
HEINZ B. EISENSTADT  
SAMUEL S. FEUERSTEIN  
HANS J. JOSEPH  
LOUIS K. MORGANSTEIN

RUDOLPH POLANCZER  
JACOB A. RIESE  
H. M. ROBINSON  
LOUIS A. ROSENBLUM  
ARNOLD STANTON  
REGINALD B. WEILER

### GASTROINTESTINAL TRACT

#### ALIMENTARY TRACT IN DISSEMINATED SCLERODERMA WITH EMPHASIS ON SMALL BOWEL: Herbert L. Abrams, William H. Carnes, and John Eaton. *A.M.A. Arch. Int. Med.*, 94:61, (July), 1954.

Two clinical groups of scleroderma patients with gastrointestinal pathology may be distinguished. In one dysphagia is prominent and persists for a long time. It is followed after years by epigastric fullness, intermittent cramping pains, nausea, and terminally, vomiting and diarrhea. In the other group dysphagia is absent and abdominal pain, fullness, anorexia, nausea and vomiting are prominent symptoms. These cases progress rapidly with fatal outcome in a short period of time.

Clinically, there are no specific findings from the gastrointestinal tract but the presence of skin changes, Raynaud's phenomenon and soft tissue calcification should put the examiner on the alert. The only interesting laboratory finding is a flat glucose tolerance curve. X-ray changes are very characteristic and consist of an abnormal widening of short or large segments of the

gastrointestinal tract with stiffening and decreased or absent peristalsis. Most frequently involved are the lower esophagus, the third portion of the duodenum and the jejunal loops, but any part of the gastrointestinal tract may be affected. Narrowing of the distal esophagus due to esophagitis or peptic ulceration occur infrequently. The colon may be atonic and show "sacculations". There is a greatly delayed passage of the barium through the dilated segments; the barium head reaching the cecum after 8-12 instead of 2-4 hours. This delayed passage is even noticeable in the presence of diarrhea. The differential diagnosis has to consider amyloid, leukemic infiltration, paralytic ileus and small bowel obstruction. Treatment with ACTH and cortisone usually gives temporary relief.

H. B. EISENSTADT

#### ELASTICA DISEASE: Leo Kaplan and Sherman W. Hartman. *A.M.A. Arch. of Int. Med.*, 94:489, (Sept.), 1954.

Pseudoxanthoma elasticum is a rare familial skin disease, characterized by flat yellow papules of pinhead to pea-size, symmetrically distributed in the flexural folds, the side of the neck, the abdomen and inner aspects of thighs associated with a loss of cutaneous elasticity and sometimes angoid streaks of the retina. Various viscera may also be involved by the abnormal status of the elastic fibers and show hemorrhagic diathesis. A patient with pseudoxanthoma is described who required gastric resection for uncontrollable hematemesis. Degeneration of the arterial elastica with microaneurysms

was encountered. As only 10 similar cases have been reported in the world literature this condition is indeed a rare one. However, such a case should remind the gastroenterologist to inspect carefully the skin and the mucous membranes in any patient with gastrointestinal hemorrhage because of the large number of entities where visible abnormalities might give a clue to the cause of such bleeding and to insist upon dermatological consultation and skin biopsy if unusual findings are present.

H. B. EISENSTADT

**AN INTERIM REPORT UPON THE "SECOND LOOK" PROCEDURE FOR GASTRO-INTESTINAL CANCER AND FOR LIMITED INTRAPERITONEAL CARCINOMES:** O. H. Wangenstein; J. Lewis; S. W. Arbelger; J. J. Muller and L. D. Machean. *Surg. Gynec. and Obst.*, pp. 257-267, (Sept.), 1954.

The second look in cancer surgery is a new concept employing systematic operations for the removal of asymptomatic residual cancer. It was used in 103 patients with cancer of the stomach, rectum, or colon where there were regional lymph node metastases at the original operations. The plan was to reoperate in 6 to 8 months usually—even though there was no clinical evidence of residual cancer. At this time all residual cancer if found was excised if possible, and then additional operations were done every half year until one operation was

performed at which no more cancer was found.

In the author's series, six patients with residual cancer seen at the second operation were finally found to be free of the growth at some subsequent operation. They are still alive without evidence of residual cancer. One of the six had cancer of the stomach, one of the rectum, and 4 of the colon. The second look it is concluded appears to be a promising procedure in patients with colon cancer.

J. R. VAN DYNE

**THE PATHOLOGIC ASPECTS OF ASCARIASIS:** McKenzie P. Moore, Jr. *Southern M. J.* 47:825, (Sept.), 1954.

Serious complications of ascariasis are encountered only rarely. However, they do occur especially in children with heavy infestations. In the abdomen balls of intertwined worms may cause intestinal obstruction, volvulus, or intussusception. Furthermore, hepatic and pancreatic abscesses, acute pancreatitis, obstruction of the bile ducts, and perforation of any part of the gastrointestinal tract may be observed.

The author describes a patient with an acute hemorrhagic pancreatitis following obstruction of the main pancreatic ducts by

worms. Another patient died of an acute pericarditis due to multiple perforations of the stomach by ascaris. Such an event seemed to be brought on by migrating efforts of the worms after administration of a vermifuge which did not kill on contact. The last patient showed a chronic adhesive peritonitis in connection with numerous foreign body granulomas of the mesentery and the peritoneum surrounding embryonated ascaris ova which had penetrated the intestinal wall.

H. B. EISENSTADT

## STOMACH

**AN EVALUATION OF HYPNOTICALLY INDUCED RELAXATION FOR THE REDUCTION OF PEPTIC ULCER SYMPTOMS:** H. Moody. *Brit. J. Med. Hypnot.*, 5:23-30, 1953.

This study includes twenty patients of similar socio-economic background. All had duodenal ulcers, of more than six years' duration. Ten received conventional ulcer therapy, and ten were treated by hypnotherapy alone. The latter group received therapy through 13 one-hour sessions. No attempt at uncovering was made, instead the

effort was mainly directed toward obtaining relaxation. Some success crowned efforts to teach these patients to induce autohypnosis. The experimental hypnotic group did better than the control medically-treated group, according to pooled radiographic diagnosis.

REGINALD B. WEILER

**MECHANISM OF PAIN WITH PEPTIC ULCER:** Arthur L. Bloomfield. *Am. J. Med.*, 27:165, (Aug.), 1954.

Two theories have been formed about ulcer pain causation, one maintains that it is due to direct irritation of the ulcer by gastric juice, the other that it follows some dis-

turbance of gastric motility. There is evidence for and against either theory. Most confusing is the experience that the presence of an ulcer and the persistence of pain do

not always run entirely parallel as the symptoms may subside long before the ulcer has healed and they may persist in spite of the disappearance of the ulceration. Evidence against the acid irritation theory are the following observations: an ulcer may remain completely asymptomatic until bleeding or perforation takes place; ulcer-like symptoms may occur in the absence of a peptic ulceration and even in the absence of gastric acidity; pain may persist after the excision of an ulcer; relief of symptoms occurs promptly with conservative treatment without change of gastric acidity; alkali or food abolish the pain in doses far too small to neutralize all the acid; reproduction of pain by instilling acid into the stomach is not

constantly effective; withdrawal of acid by intubation may relieve pain without removal of all gastric contents; reactivation of gastric ulcers by adrenal steroids which is apparently due to an increase of gastric acidity and pepsin is very often asymptomatic until bleeding; perforation or discovery by x-ray takes place. Evidence in favor of disturbed motility are the following observations: insertion of a small balloon into the duodenum may reproduce the typical pain of duodenal ulcer; gastroscopic and fluoroscopic studies at the time of pain paroxysms may show abnormalities of motility coinciding with pain and disappearing together with it after the administration of anticholinergic drugs.

H. B. EISENSTADT

**THE STOMACH IN PERNICIOUS ANEMIA; A CYTOLOGIC STUDY:** Barbara W. Massey, and Cyrus E. Rubin. *Am. J. M. Sc.*, 227:481 (May), 1954.

Cytologic examination for the detection of malignancy in 21 patients with pernicious anemia were performed by three different methods: gastric lavage with Ringer's solution; chymotrypsin lavage and abrasive balloon. In all patients, cells were found differing from normal columnar cells as well as from carcinoma cells. These cells were absent in 150 examinations on persons without pernicious anemia. Among the latter group were cases of gastric cancer, non-pernicious anemias, and histamine refractory achlorhydrias.

The cells characteristic of pernicious anemia, the so-called "P.A. cells," were larger than normal cells; both nucleus and cytoplasm being increased. Their cytoplasm had a vacuolar and granulated appearance; there were perinuclear halos. Their nuclei had a creased and folded membrane and contained

dense chromatin aggregates and large refractile nucleoli. Previously these cells had been mistaken for carcinoma cells. They were present in antral as well as in fundal scrapings. These findings show that macrocytosis and nuclear abnormalities are not limited to the blood cells in pernicious anemia. Similar changes have been observed also in the esophagus, stomach, lungs, and vagina. The "P.A." cells of the stomach did not seem to disappear after years of specific therapy indicating the irreversibility of the gastric lesions. If the latter observation proves to be correct the diagnosis of pernicious anemia can be established by the study of the gastric cytology even after complete remission of the blood picture has been obtained by appropriate treatment.

H. B. EISENSTADT

**A SURGEON'S CLASSIFICATION OF CARCINOMA OF THE STOMACH—Preliminary Report.** S. O. Hoerr. *Surg. Gynec. and Obst.*, pp. 281-286, (Sept.), 1954.

Present classifications of carcinoma of the stomach are not entirely satisfactory to surgeons. A simplified classification based upon 3 stages of metastases and 3 stages of invasion by the primary tumor is presented: Metastases: Stage A—no metastases; Stage B—regional metastases; Stage C—distant metastases. Invasion: Stage I—superficial cancer; Stage II—cancer in all gastric layers; Stage III—cancer invading by continuity structures outside of the stomach. A combination of letter and numeral, the first representing the stage of metastases, the

second the degree of invasion designate the state of the disease in the patient at the time of operation. Thus A-I represents a superficial cancer without metastases and implies a favorable prognosis. The classification has been tested on a consecutive series of 100 patients, all of whom have been followed 1 to 4 years after operation. There is good correlation between the results to date and the prognosis implied by the classification.

J. R. VAN DYNE

## INTESTINES

**DIARRHEA AND VOMITING WITH FATAL CIRCULATORY COLLAPSE IN CHILDREN AFTER CHLOROMYCETIN AND TERRAMYCIN MEDICATION. DISCUSSION ON STAPHYLOCOCCIC ENTERITIS:** R. Cramer and E. Rossi. *Helvetica paediatrica acta*, 8:544, (Dec.), 1953.

An increasing number of cases of vomiting, diarrhea, and collapse following antibiotic therapy has been reported in adults. The authors add five cases of a similar disturbance in children 2% to 10% years of age, all cases had a fatal outcome. Some received terramycin, others chloromycetin for 5-10 days prior to the beginning of a sudden attack of violent vomiting and diarrhea with watery or mucus stools followed by hyperthermia, collapse, cyanosis and death. Blood picture showed leucocytosis or leukopenia and toxic changes of the granulocytes. Autopsy revealed typical pseudomembranous lesions of the small and large intestines and sometimes also of the mouth, esophagus and stomach. Stool culture at the

time of the spell usually showed staphylococci resistant to the previously administered antibiotics. In one case there was a general staphylococcal septicemia. In this case not only the stool but also the sputum, the urine and the spinal fluid contained coagulase positive staphylococci. The latter as well as other resistant bacteria and fungi have been linked to the cause of this fulminating disorder, either by producing enterotoxins or septicemia or both. Acute gastrointestinal disorders following antibiotic treatment are more dangerous in children than in adults and their mortality is high in those young patients in spite of all methods of treatments available at this time.

H. B. EISENSTADT

**WHIPPLE'S INTESTINAL LIPODYSTROPHY:** Michael J. Lepore, *Am. J. Med.*, 17:160, (July), 1954.

A case of Whipple's lipodystrophy is reported in a 56-year old male who suddenly encountered diarrhea, weakness and weight loss without corresponding anorexia. He passed 4-6 stools daily which were fluid, foul and of light yellowish color but did not contain blood or mucus. The previous history was noncontributory except for migratory polyarthritis. Laboratory examinations showed moderate normochromic anemia, flat oral glucose tolerance test, low Vitamin A and absent carotene levels in the serum.

The stool contained numerous fatty acid crystals. On the basis of these findings and the x-ray changes nontropical sprue was suspected, however, the presence of fever, drenching night sweats, very fast sedimentation rate and occult blood in the stool directed the author's attention to the possibility of Whipple's disease. This diagnosis was confirmed by exploratory laparotomy and mesenteric lymph node biopsy.

H. B. EISENSTADT

**ROENTGEN OBSERVATIONS OF THE ILEOSTOMY IN PATIENTS WITH IDIOPATHIC ULCERATIVE COLITIS. 1. THE WELL FUNCTIONING ILEOSTOMY:** Felix G. Fleischer, Paul Mandelstam and Benjamin M. Banks. *Radiology*, 53:74-80, (July), 1954.

This paper is an addition to our knowledge of the structure and function of the ileum after ileostomy in ulcerative colitis. Ileal dysfunction is seen frequently and in almost two out of three cases there is evidence of severe dysfunction after surgical intervention.

The 13 cases that were studied were considered to have well functioning ileostomies.

The small intestine was studied both by means of oral meal and by enema through the ileostomy opening.

The range in transit time of the orally administered barium is no different from that observed in the average healthy pa-

tient. The pattern of the jejunum and the ileum and the distribution of the barium are normal. However, the enema studies are revealing. In these cases the prestomal ileum is found to be narrow although within normal limits according to these observers. Formed fecal matter is present, supporting the contention of other workers that the lower ileum is capable of inspissating its contents whether or not the colon has been removed. In the well functioning ileostomy, the prestomal ileum shows no evidences of dilatation or reservoir function.

IRVIN DEUTSCH

**PERIARTERITIS (Polyarteritis) NODOSA PRODUCING INTUSSUSCEPTION:**

Report of Two Cases: Hyman J. Zimmerman, William P. Kleitsch, Arthur M. Greene and Harry F. McFadden, Jr. *A.M.A. Arch. Int. Med.*, **94**:264, (Aug.), 1954.

Periarteritis nodosa produces gastrointestinal symptoms in a great number of cases. Abdominal pain, distention, anorexia, nausea, vomiting, etc., will be due to peritoneal irritation as well as to involvement of various intraabdominal organs. In the majority of such cases the treatment has to be conservative. However, true surgical emergencies may arise as for instance, perforation or infarction with gangrene of a viscus, exsanguinating internal hemorrhage,

and bowel obstruction.

Two cases of intussusception of the cecum are described produced by granulomatous masses in the cecal wall that required surgical intervention. One patient revealed a palpable mass in the right lower quadrant, the other a round smooth filling defect of the cecum after barium enema. Both persons tolerated bowel resection well.

H. B. EISENSTADT

**STUDY OF THE SIGMOID BY SPECIAL ROENTGENOGRAPHIC VIEWS: A. Ettinger and M. Elkin. *Am. J. Roentgenol.*, **72**:199-208, (Aug.), 1954.**

In occasional cases the sigmoid and rectosigmoid cannot be examined with complete satisfaction by barium enema at roentgenoscopy or by roentgenology due to its multi-coiled nature. This may be tragic in view of the fact that malignancy occurs most frequently at these sites. The authors indicate the special views that may be necessary and several examples are presented. Of particular interest to the gastroenterologist is the Chassard-Lapine position where small

growths, otherwise unseen, are now found to be visible. The patient in this latter position is seated at the edge of the x-ray table in a flexed position so that the thighs almost touch the bent chest. The x-ray beam is projected perpendicularly through the lower spine and sacral area to the underlying Bucky plate. In this projection the x-ray factors used are the same as though the patient were taking a lateral spinal film.

J. R. VAN DYNE

**DETORSION OF VOLVULUS OF THE RIGHT COLON: L. S. Figiel and S. J. Figiel. *Am. J. Roentgenol.*, **72**:192-198, (Aug.), 1954.**

Three cases of volvulus of the right colon are presented, two of which were reduced at the time of expulsion of the barium enema which had been performed for the purpose of diagnosis. The third patient's volvulus was reduced by special positioning in the knee-chest posture. The authors on this basis advise barium enema studies for diagnostic confirmation in cases of suspected volvulus as well as for the augmented effect of detorsion in certain cases. In addition,

where necessary, the knee-chest posture can safely be considered a therapeutic measure in selected cases where detorsion hasn't otherwise occurred. This is an interesting report because it stresses the experiences of many gastroenterologists, the present reviewer not excepted, who have had such detorsion occur in patients unexpectedly when the diagnostic films were being taken.

J. R. VAN DYNE

**PSYCHOSOMATIC MEDICINE****PROGRESS OF PSYCHIATRY AND THE UTILIZATION OF ITS PRINCIPLES IN THE DAILY PRACTICE OF MEDICINE: Leo H. Bartemeier. *World M. J.*, **1**:13-17, (Jan.), 1954.**

No one can take the place of a young child's mother, especially during illness. Benefits of hospitalization often are overcome in children sustaining the trauma of separation. Emotional injury inflicted before five frequently forms the nucleus of adult illness. Utilization of psychiatric principles in the

practice of medicine involves patient orientation. This integration between psychology and general medicine requires basic teaching in medical school. For example, how the gastrointestinal tract is involved in the unconscious drive to discharge emotional impulses can be demonstrated more effec-



tively by the internist or surgeon than by the psychiatrist.

If medical treatment is to be comprehensive, teaching should stress the person as a total being. There are psychiatric implications in the care of every person who must be studied with consideration of the broad generalizations of dynamic psychiatry. The doctor must be cognizant that neuroses are real, not imaginary, that a patient in pain or distress is just as sick regardless of the presence or absence of physical findings.

The general practitioner should deal with the patient's superficial problems rather than with deep material. Progress in psychiatry will be hindered until every doctor has basic

psychiatric knowledge and utilizes proper technic. In many illnesses the doctor-patient relationship is as important as any other skill utilized, and in some illnesses it is more vital. The more aware the doctor is of his role in the patient's eyes and the patient's regressed emotional attitudes the more the benefits will be. The doctor must familiarize himself with the nature of the illness, how the patient lives, his feelings in respect to work, family and others. It is as important to know what kind of person has an illness as to know what kind of illness a person has.

REGINALD B. WEILER

#### PSYCHOLOGIC NEEDS OF THE MEDICALLY AND SURGICALLY ILL PATIENT:

David A. Boyd. Wisconsin M. J., 53:158-160, 169-175; 1954.

Much difficulty may be prevented or controlled before unfavorable progress has set in if the emotional problems of all patients are considered. Disturbed emotional states may be activated by protracted pain, metabolic or hormonal dyscrasias, or because of some other disharmony within the physiological adjustment mechanism. The vast majority of untoward emotional or behavior disturbances, however, have their origin within the psychic realm. It is mandatory to correct these because they are potential aggravators of somatic symptoms which leads to greater pathophysiological disharmonies. Further, psychological reactions are potent factors in keeping a patient from observing proper medical regimes or in actually doing things which defeat treatment.

The mental or psychological body image is a basic factor in all illness. The concept of the body image involves the person's psychological appreciation of the external and internal construction and placement of the various somatic structures. Health itself presents a body image of esthetic beauty,

harmonious functions and complete integrity. Any illness or surgery distorts this image and is a potent factor in precipitation of emotional problems.

Acute illness is often accompanied by fear of death or mutilation. Chronic illness involves an entire reorientation in which distortion of evaluations of self and others arises. The emotional balance is disturbed and overt behavior and affective problems occur.

Stress of great intensity or existing for prolonged periods is intolerable so that various defenses are mobilized to combat it. The behavior regresses to that of the childhood pattern.

Good relationship between patient and physician is a prime necessity if the patient's emotional problems are to be understood and if he is to be aided in establishing a more realistic reactivity. Explanations should be communicated in terms easily understood by the patient.

REGINALD B. WEILER

#### PUBLIC RELATIONS CONFERENCE: Address of Dr. Leo H. Bartemeier. J.A.M.A. 154:515-516, (Feb. 6), 1954.

Adequate medical care involves the personality of the physician. People inquire, concerning a doctor: "What is he like? What sort of a man is he?" This resembles medical philosophy which maintains the importance of the kind of a person that has an illness as well as what illness he has. Thirty to forty per cent of illnesses represent personality reactions to crises and stresses. It is

not a question of organic or functional illness, but rather to what extent it is organic and what extent it is functional, because all illness is a combination of both.

Sick or injured persons undergo psychological intrapersonal relationship changes which may be more important than the illness itself. Patients may expect their doctor to relieve them instantly by magic.

They are repeating their expectations of childhood when as frightened youngsters their mother's reassurance acted as a cure. Many patients expect the same understanding and apparent omnipotence from their physician which they had attributed to their parents. The past is always a part of the present and often more decisive than the illness as such.

With some patients pangs of anxiety result from the dread that they are suffering the same fate as some member of the family whose death they had, as children, unconsciously sought. The expression "You won't let anything happen to me, will you doctor?" expresses all of this and more. Failure to understand, tends not only to drive patients away, but also mitigates

against cure.

Illness brings regression with it because of the feeling of being helpless and completely dependent on others and is reminiscent of infancy, which is secretly longed for. It is not asking the doctor to take on the specialty of psychiatry in asking him to use some general principles of psychology which understanding supplies to him. The secret of the care of the patient is in caring for the patient.

There is an urgent need for recognition that all patients are as children who turn to their physician, whom they endow with the same wisdom, good judgment, and magic that they always thought their parents possessed.

REGINALD B. WEILER

"THE NEAREST APPROACH TO THE CONTINUOUS  
INTRAGASTRIC DRIP FOR THE AMBULATORY PATIENT"

## NULACIN

A pleasant-tasting tablet...to be dissolved slowly  
in the mouth...not to be chewed or swallowed...  
made from milk combined with dextrins and maltose  
and four balanced nonsystemic antacids...\*

Promptly stops ulcer pain...holds it in abeyance...  
hastens ulcer healing.

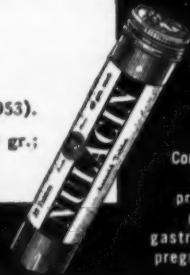
In tubes of 25 at all pharmacies. Physicians are in-  
vited to send for reprints and clinical test samples.

\*Steigmann, F., and Goldberg, E., J. Lab. & Clin. Med. 42:955 (1953).

\*\*Mg trisilicate, 3.5 gr.; Ca carbonate, 2.0 gr.; Mg oxide, 2.0 gr.;  
Mg carbonate, 0.5 gr.

**HORLICKS CORPORATION**

Pharmaceutical Division • RACINE, WISCONSIN



Continuous gastric  
anacidity for  
prompt relief in  
peptic ulcer,  
gastritis, hyperacidity,  
pregnancy heartburn.

## BOOK REVIEWS FOR GASTROENTEROLOGISTS

**GERMAN-ENGLISH AND ENGLISH-GERMAN DICTIONARY IN TWO VOLUMES:**  
Professor Fritz Lejeune and Werner E. Bunjes. Georg Thieme Verlag, Stuttgart, Germany. Price DM 33 per vol.

Volume 1—German-English 1954 edition is written by Prof. Lejeune, contains about 430,000 words, while Volume 2—written in conjunction with Werner E. Bunjes, 1953 edition, contains about 75,000 words. There are 3,084 pages in the two volumes. The

printing and style are very good and both are bound substantially.

Medical students and physicians who are interested and read German, will find these two dictionaries of material help.

**ROENTGEN DIAGNOSIS—VOLUME IV—GASTROINTESTINAL TRACT, GYNECOLOGY, UROLOGY:** Dr. H. R. Schinz, Dr. W. E. Baensch, Dr. E. Friedl, Dr. E. Euhlinger. First American Edition (based on the fifth German edition). English translation arranged and edited by James T. Case, M.D., D.M.R.E. (Camb.), Professor of Radiology Emeritus, Northwestern University Medical School, Chicago, Ill. 4029 pages, profusely illustrated, extensive references and cross-index. Grune and Stratton, New York, N. Y., 1954. Price \$50.00.

In addition to the original editors, numerous contributors have made this extensive volume the most complete and comprehensive textbook dealing with roentgen diagnosis of the gastrointestinal tract, gynecology and urology.

Medical students, general practitioners or specialists will find information and advice as to the best method of obtaining readable roentgenograms for diagnosis.

Before giving the patient a contrast meal, it is advisable to take a scout or exploratory film, thus avoiding errors in diagnosis. Es-

pecially, this is indicated with a clinical picture resembling intestinal obstruction, stones or calcification.

Valuable suggestions are offered in preparation of the patient for examination of the esophagus, stomach and intestine. Contrast media, fluoroscopic and roentgenographic technic is fully described and should be read carefully by the novice as well as the advanced worker.

The reviewer found this large, although expensive volume, a worthwhile addition to the library of the physician.

**CURRENT THERAPY 1954:** Edited by Howard F. Conn, M.D., with a staff of consulting editors, consultants and contributors in the various specialties and subspecialties. 898 pages. W. B. Saunders Co., Philadelphia, Pa., 1954. Price \$11.00.

This edition of Current Therapy is the sixth of the annual series. Like its predecessors, it brings the busy physician up to date information on diagnosis and treatment.

Among the newer drugs, the several antibiotics and their action are ably discussed. The curative effect, toxicity, etc., are compared one against the other in a given case and thus simplifies the question often raised by the physician which he should prescribe with best results.

On page 172, the reader will find interesting and detailed information relative to congenital heart disease. On page 174, heart-failure, etc., followed by a comprehensive and instructive article on hypertension, diagnosis and treatment. Continuing along these lines, further details will be found on coronary occlusion, etc.

Turning to section five, Diseases of the

Digestive System—pages 277-330, a complete and detailed description will enlighten the general practitioner as to the various aspects of diseases of the alimentary tract.

Various other chapters—respiratory, skin, urology, etc., etc., are just as illustrative and instructive as the two chapters mentioned.

On page 460, Peyronies' Disease is explained in detail. The reviewer would like to call attention to this interesting but obscure condition, as very few text books on medicine or surgery mention it. The daily ingestion of alpha tocopherol, 50 to 100 mg. three times daily for several weeks or months, has helped in some cases.

On pages 827-848 inclusive, poisonings, symptoms and treatment are described. An alphabetical roster of drugs, an index of authors and an extensive cross-reference enhance the value of this tremendous volume.

**PRINCIPLES OF INTERNAL MEDICINE:** Editors—T. R. Harrison, M.D., Raymond P. Adams, M.D., Paul B. Beeson, M.D., George W. Thorne, M.D. and M. M. Wintrobe, M.D. 2nd Edition. 1703 pages of text, 87 pages of cross-index, illustrated. The Blakiston Co., New York, N. Y., 1954. Price: Student 1 Vol. Ed.—\$16.00, Professional—2 Vol. Ed. boxed—\$21.00.

The second edition of this large volume has been brought up to date; extensive revisions, new chapters and additions, makes this the most useful one volume reference for the busy physician.

The reader should note the advice given in the preface to this edition. If he follows the method outlined as to reading the chapter or chapters dealing with the patient's major complaints and then turns to the back

of the book for discussion of these several diseases, he will be surprised to find what he wishes to know regarding treatment, etc.

No reviewer can do full justice, nor can the physician gain insight into a given case unless both take time to carefully read and reread chapter after chapter.

It is a highly recommended text for undergraduate and graduate students and all physicians.

**PSYCHOSOMATIC CASE BOOK:** Roy R. Grinker, M.D., Director, Institute for Psychosomatic and Psychiatric Research and Training of the Michael Reese Hospital, Clinical Professor of Psychiatry, University of Illinois, College of Medicine and Fred P. Robbins, M.D., Associate Psychiatrist, Michael Reese Hospital, Staff Member, Chicago Institute for Psychoanalysis. 346 pages. The Blakiston Company, Inc., New York, N. Y., 1954. Price \$6.50.

As stated in the preface, this volume consists of a series of case histories of patients and is supposed to illustrate general problems of diagnosis, etc.

There are five chapters which deal with the following: general considerations; the problem of diagnosis; the spinal syndromes; therapy and general summary. These chapters are subdivided into 20 categories and 79 cases.

Briefly stated, the reader will find interesting and instructive cases which may help him to better understand and treat patients presenting similar symptoms described by the authors.

This volume should be of value to the clinician who is not a psychiatrist but who, like all physicians, meets patients with syndromes irrelevant to the actual disease.

**THE DYNAMICS OF VIRUS AND RICKETTSIAL INFECTIONS—INTERNATIONAL SYMPOSIUM:** Editors: Frank W. Hartman, M.D., Frank L. Horsfall, M.D. and John G. Kidd, M.D. 461 pages with numerous graphs, tables and black and white illustrations. The Blakiston Company, Inc., New York, N. Y., 1954. Price \$7.50.

The list of participants is formidable and the inclusive material is of great interest to workers in different areas of the virus and rickettsial fields. Health officers should avail

themselves of this highly instructive volume, so that they may become acquainted with the latest research and diagnostic procedures in preventive medicine.

**MEDICAL PROGRESS 1954:** Morris Fishbein, M.D., Editor. 345 pages. The Blakiston Company, Inc., New York, N. Y. Price \$5.00.

Twenty contributions by eminent clinicians including the editor, Dr. Fishbein, bring the progress of medicine up to date. Several chapters are duplicated, that is, brought up to date for 1954 and other chapters which dealt with a given disease in the 1953 edition were omitted.

New chapters by Ober, Sandweiss, Krusen, Rusk and other specialists enhance this new 1954 volume.

It is highly recommended as a ready reference book and should be on the desk of all physicians.

**Upjohn**

# preoperative bowel preparation within 24 hours:

---

## Mycifradin *tablets*

Trademark for the Upjohn brand of neomycin

Each tablet contains 0.5 Gm. neomycin sulfate (equivalent to 0.35 Gm. neomycin base). In bottles of 20 tablets.

*Also available:*

Mycifradin Sulfate Powder (topical) in vials of 0.5 Gm. and 5 Gm.

Mycifradin Sulfate (intramuscular) in vials of 0.5 Gm.

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN





for the "squeeze" of g.i. spasm

*antispasmodic action  
virtually without atropinism*

*through the selective spasmolysis  
of homatropine methylbromide  
(one-thirtieth as toxic as atropine) ...  
plus the sedation of phenobarbital.*

Each yellow tablet of **MESOPIN-PB**  
or teaspoonful of yellow elixir  
contains 2.5 mg. homatropine methyl-  
bromide and 15 mg. phenobarbital.  
Also available as  
**MESOPIN Plain** (without phenobarbital)  
in white tablets, green elixir, and powder.

\*Trademark of Endo Products Inc.

# MESOPIN-PB

Trademark

(Homatropine Methylbromide and Phenobarbital)

## Endo<sup>®</sup>

Samples? Just write to:

Endo Products Inc., Richmond Hill 18, New York

*now... New strength Mesopin-PB Tablets... 5 mg.  
homatropine methylbromide with 15 mg. phenobarbital.  
Also now available - Mesopin (plain) 5 mg. tablets.*

# FITTING THE ANTACID PROGRAM TO THE PATIENT'S ACTIVITIES

As logical for *convenience* as they are for *therapy*, ALUDROX Tablets can be taken with or without water wherever the patient may be. Away from home, on the job, on the street, ALUDROX Tablets sustain the antacid program by making it practical. They are refreshing in taste, pleasant to chew and swallow.

ALUDROX combines aluminum hydroxide and milk of magnesia in the therapeutic ratio<sup>1</sup> of 4:1. Promptly combats gastric acidity, counteracts tendency to constipation, promotes healing of the ulcer.

*Supplied:* ALUDROX Tablets, boxes of 60.

*Also available:* ALUDROX Suspension, bottles of 12 fluidounces

*1. Rossett, N. E., and others: Ann. Int. Med. 36:98 (Jan.) 1952*



## ALUDROX<sup>®</sup>

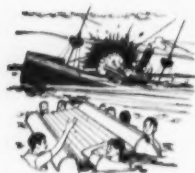
Aluminum Hydroxide Gel with Magnesium Hydroxide



PHILADELPHIA 2, PA.



## "¡Valiente!" cried the Spanish admiral



He cheered as his launch fished this man and seven more water-logged American sailors out of Santiago Harbor, Cuba, on the morning of June 4, 1898. This was straining Spanish chivalry to the breaking point, for Richmond Hobson (right) and his little suicide crew had spent the previous night taking a ship into the harbor entrance under a hail of cannonade and deliberately sinking her to bottle up the Spanish fleet.

Hobson was actually an engineer, not a line officer. In Santiago Harbor, he led his first and only action against the enemy. But his cool-headed daring made him as much a hero of the day as Admiral Dewey. And proved again that America's most valuable product is Americans.

These Americans—proudly confident of their nation's future—are the people who stand behind United States Series E Savings Bonds. They are the people who, by their spirit and abilities, make these Bonds one of the world's finest investments.

That's why there's no better way to protect your future than by investing in America's future! Buy Bonds regularly!




It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done for you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank. There's no surer place to put your money, for United States Savings Bonds are as safe as America!

*For your own security—and your country's, too—  
invest in U. S. Savings Bonds!*

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.





*"...better palatability  
and freedom from  
constipating effects,  
dryness and  
astringency."*

Morrison, in treating a large series of patients with Maalox-Rorer, describes this better-tolerated preparation as "... a palatable, antacid, demulcent, nonconstipating colloidal suspension of magnesium and aluminum hydroxides, useful for the relief of hyperacidity."

This clinician concludes: "Magnesium aluminum hydroxide gel is more palatable than aluminum hydroxide gel and better suited to the prolonged administration required for the antacid therapy of peptic ulcer and hyperchlorhydria."<sup>1</sup>

A well-balanced suspension, notable for its smooth texture and pleasant flavor, Maalox has gained remarkable patient acceptance.

**Supplied:** in 355 cc. (12 fluid ounce) bottles. In tablet form, bottles of 100. Each tablet equivalent to 1 fluidram of the suspension.

*Samples sent promptly on request.*



**WILLIAM H. RORER, INC.**  
Philadelphia 6, Pa.



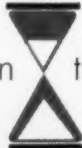
1. Morrison, Samuel: Magnesium aluminum hydroxide gel in the antacid therapy of peptic ulcer, *Am. J. of Gastroenterology* 22:309 (Oct.) 1954.



visceral eutonic

# DACTIL

PLAIN AND WITH PHENOBARBITAL

relieves **pain** → **spasm** usually in  ten minutes



DACTIL relieves gastroduodenal or biliary pain so quickly that you can usually see it work right in your office.

DACTIL capsules act at the site of visceral pain—relieve pain → spasm within minutes and control spasm within two days. Unusually well tolerated, DACTIL does not interfere with gastrointestinal or biliary secretions, normal tonus or motility.

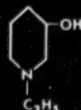
## TWO FORMS *QID*

DACTIL with Phenobarbital in bottles of 50 capsules. There are 50 mg. of DACTIL and 16 mg. of phenobarbital (warning: may be habit-forming) in each capsule.

DACTIL (plain) in bottles of 50 capsules. There are 50 mg. of DACTIL in each capsule.

DACTIL, first of the Lakeside piperidol derivatives, is the *only* brand of N-ethyl-3-piperidyl diphenylacetate HCl.

*L*akeside • PIONEERS IN PIPERIDOLS  
laboratories, INC. - MILWAUKEE 1, WISCONSIN



75134



for the "Sippy-diet" patient  
a welcome (and often necessary) change from "milk-and-cream"

## MULL-SOY<sup>®</sup> Powdered



Pioneer soy alternative to milk... reported to be "noticeably more soothing to the upper gastrointestinal tract and seemingly easier to digest."<sup>1</sup> Comparable to milk in buffering<sup>2</sup> and nutritional<sup>3</sup> qualities. Contains no cholesterol... and costs the patient *much* less than milk-and-cream. Easy to prepare—4 level tablespoonfuls to 8 oz. water. In 1-lb. tins at all drug outlets.

1. Balfour, D. C., Jr.: *Am. J. Gastroenterol.* 22:181, 1954.  
2. Burke, J. O., et al.: *Internat. Rec. Med. & Gen. Practice Clin.* 157:587, 1954. 3. Sternberg, S. D., and Greenblatt, I. J.: *Ann. Allergy* 9:199, 1954.

Are you wondering how MULL-SOY Powdered tastes? Return this coupon for professional trial samples and see for yourself how *pleasant* it can be for your milk-weary or milk-intolerant ulcer patients.

THE BORDEN COMPANY  
Prescription Products Division, Dept. 204  
350 Madison Avenue, New York 17, N. Y.



Please send to me, without charge, four 4-oz. tins of MULL-SOY Powdered.

Dr. \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_

# the Resions

...specifics  
in  
diarrhea

## Resion

time-tested, adsorbent effectiveness

Polyamine methylene resin	10%
Sodium aluminum silicate	10%
Magnesium aluminum silicate	1.25%

and

## Resion P-M-S

A new formula providing antibacterials to combat bacillary and fungal vectors



Dosage: RESION—1 tablespoonful hourly for 4 doses; then every 3 hours while awake. RESION P-M-S—1 tablespoonful hourly for 3 doses; then 3 times daily.

Supplied: RESION, in bottles of 4 and 12 fluid ounces. RESION P-M-S, bottles of 4 fl. oz.

The RESIONS offer two effective compounds for treatment of almost any diarrheal condition found in clinical practice.

The RESIONS act by ion exchange . . . to attract, bind and remove toxic materials in diarrheas caused by food or bacterial toxins; by prolonged use of certain drugs, and in general infectious diseases.

The RESIONS are safe because they are totally insoluble and non-toxic.

RESION therapy will control about 90% of common diarrheas.

RESION P-M-S is intended specifically for rapid control of those rare diarrheas caused by Gram-negative organisms; to prevent secondary bacterial infection; in mycotic diarrhea following the use of the broad-spectrum antibiotics, and to inhibit the enteric growth of *C. albicans* (Monilia).



CONGO MAGIC  
(Dysentery Fetus)

Resion therapy now works  
scientific magic  
against diarrhea.

Each 15 cc. contains the RESION formula plus:

Polymyxin-B sulfate	125,000 units
Phthalylsulfacetamide	1.0 Gm.
Para hydroxy benzoic acid esters	0.235 Gm.

THE NATIONAL DRUG COMPANY  
Philadelphia 44, Pa.

**"...a potent antihemorrhagic factor"\***

**in use in more than 2500 hospitals**

Adrenosem controls capillary bleeding and oozing by acting directly on the walls of the blood vessel. It decreases permeability.

This unique hemostat does not alter blood components, nor does it affect cardiac rate or volume. Useful both prophylactically and therapeutically. It is notable for a high index of therapeutic safety. Supplied in ampuls, tablets and as a syrup.

*\*Sherber, P.A., The control of bleeding, Am. J. Surg. 86:331 (Sept.) 1953.*

Indicated in postoperative bleeding associated with:  
Tonsillectomy, adenoidectomy and sinusoidal surgery  
Prostate and bladder surgery  
Meningeal bleeding  
Postpartum hemorrhage  
Dental surgery  
Chest surgery and thoracic pulmonary bleeding

Also effective against:  
Internal hemorrhage  
Esophageal telangiectasia  
Epistaxis  
Hematuria

**The unique systemic hemostat**

**Send for detailed literature**

**Adrenosem<sup>®</sup>**  
**SALICYLATE**

(BRAND OF CARBAZOCHROME SALICYLATE)

**THE S. E. MASSENGILL COMPANY, Bristol, Tennessee**



## The Physician's Antacid...Why?

When a physician needs an antacid, what is his personal choice?

We know, from daily contact with thousands of physicians from coast to coast, that a great number use Gelusil personally and for their families. Our professional service records show that many doctors have used it for years for hyperacidity and related gastrointestinal disturbances.

Why?

They can have their pick of antacids, yet they use Gelusil. A phy-

sician, like his patients, demands effectiveness without side effects.

He gets this with Gelusil—fast, lasting relief from each dose, and no trouble with constipation or other aberrations, even with prolonged use. Its palatable flavor is refreshing and always acceptable.

An ever-larger group of doctors and their patients agree on Gelusil. Each year the usage of Gelusil increases substantially.

WARNER-CHILCOTT LABORATORIES

New York 11, N. Y.

# *Gelusil*<sup>®</sup>

THE PERSONAL ANTACID OF MANY PHYSICIANS BY PERSONAL PREFERENCE